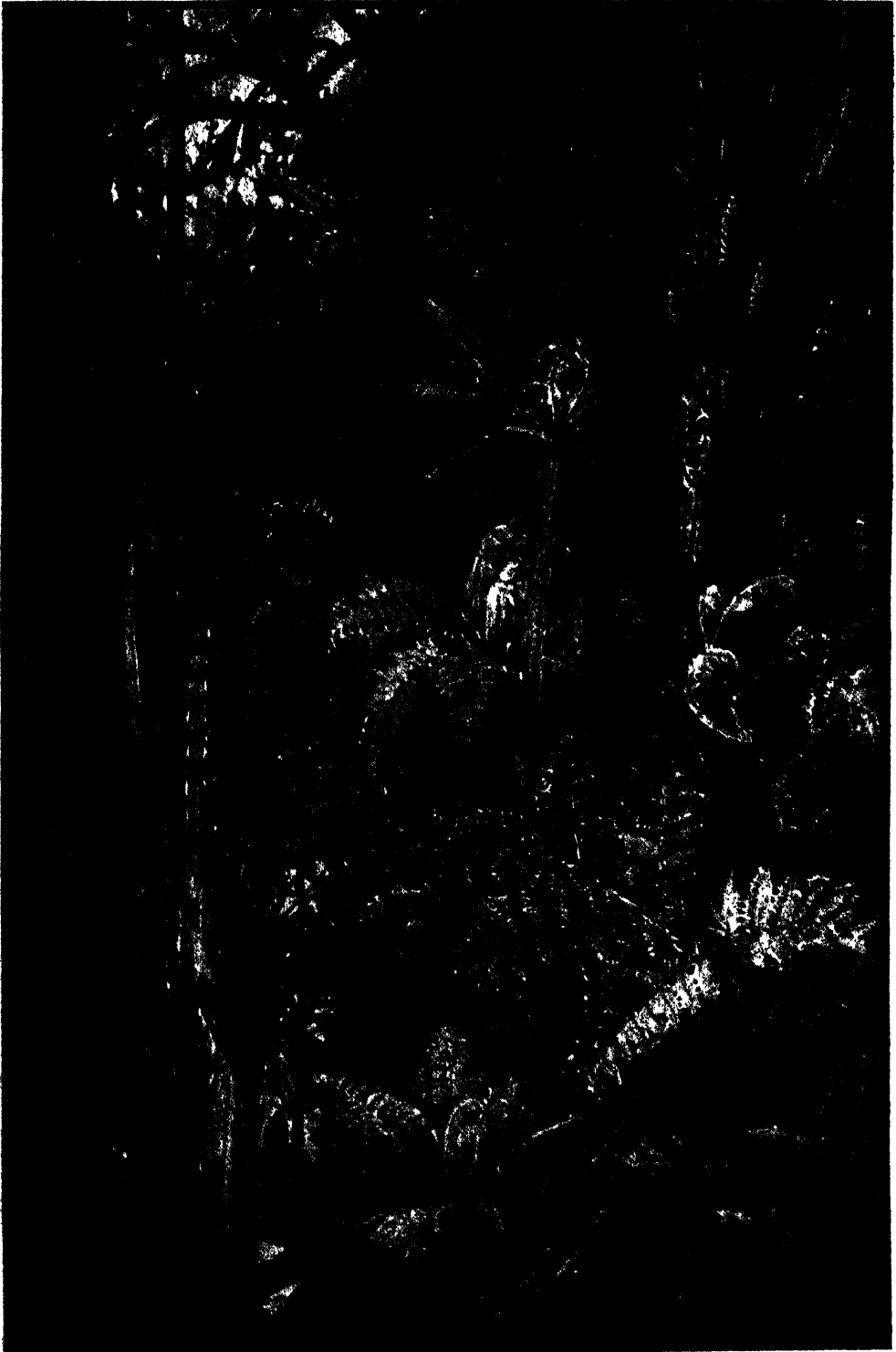


THE PLANTS THAT STORED UP SUNSHINE



This picture shows what coal was like millions of years ago. Great ferns and trees like these grew in the forests before men began to live in the world. The sun poured down upon them, and for hundreds of years the trees drank in the sunshine. Then the trees fell and were covered with earth, and long afterwards men dug deep holes and found these trees, all turned to coal. Deep down in the earth lay the sunshine, locked up in the great forest trees, and if you will take up a piece of coal you may find upon it still the mark of a leaf that was alive in the forest a million years ago. Refer to article page 829.

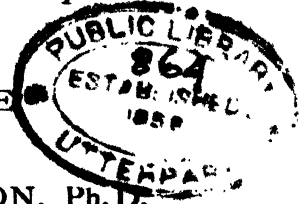
The Book of Knowledge

The Children's Encyclopædia

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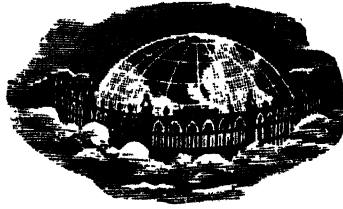
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This is a short guide only to the principal contents of this volume. It is not possible to give the titles of all the Poems and Rhymes, Legends, Problems, color pages, questions in the Wonder Book, and many other things that come into the volume; but in all cases the pages where these parts of our book begin are given. The full list of these things comes into the big index to the whole work.

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The Book of POETRY

THE USES OF POETRY

IT is a curious thing that so many people seem to think it is not worth their while to read poetry. They tell us that they "cannot" read it. That is because they have never tried seriously. But it is well worth the trying; and as we should grow up with a real love for poetry, we state here very briefly what are its chief uses. Poetry is the music of the universe; it stirs our feelings and fills our minds with beautiful pictures, so that if we do not learn to love and understand it we are missing something that adds greatly to the pleasure of life.

WHY SHOULD WE READ POETRY?

WE might as well ask why birds should sing as why we should read poetry. It is natural that all people with any feeling for music should love to read poetry. When children, we are more natural in our tastes than later in life, and the taste for poetry is as natural as the liking for sweet sounds, the scent of flowers, and the colors of the sunset.

Poetry expresses all these delights of nature better than any other means we have for expressing them. It is splendid to see a grand sunset; it is fine to be able to look on a great artist's picture of a sunset; but it is better—far better—to be able to remember all our lives the glorious words of some great poet who has described a sunset. Merely by recalling his magic words the joy we first felt in looking on this beautiful effect of nature arises in us as fresh as ever—it is ours for ever!

Surely this is a great thing that poetry can do. And people who do not keep the love of poetry in their hearts as they grow up lose one of the truest pleasures of life.

The writers of good poetry are few, and nothing is more foolish than to think, because we can make words rhyme with others, we can write verse. But everybody is capable of reading, enjoying, and profiting by good poetry. Therefore, we should not lose the taste for reading verses, which most of us have when we are young, but ought carefully to improve and strengthen that taste by reading as regularly as possible the works of the poets.

We have already said that poetry is

CONTINUED FROM 480



the music of words; but it is more than that. It is the music of the universe. In the whole vast and wondrous world of created things there is a harmony of beauty that is felt by the true poet, and by him conveyed to the ordinary man.

A poet once said of great poets that they had "mountain minds," and their heads were sunned before the rest of men. If we saw a range of mountains in the early morning, as the sun was rising, we should see the taller peaks shining first in the sunlight. So is it with the great poets. Hence, when the great poets write their poems for us, they are enabling us to see into the heart of nature with something of their own keen insight. They lend us their eyes, so to speak. But they lend us their hearts also, for their poems express the feelings of their hearts far more warmly and clearly than these could ever be expressed in ordinary prose writing. There is no better education than to share with the greatest minds that have lived in this world of ours their feelings, their hopes and sorrows, their joys; and poetry enables us to do this.

Yes, blessings many times on all the sweet souls who have expressed themselves in poetry, and so may be said to live for ever as the companions of our peaceful hours. They are our best friends, if we but turn to them; be it for noble words to refresh us in our hours of doubt and darkness; for fine pictures of the glories of the world to enlarge our love of its Creator; or for inspiring thoughts that urge us forward in the battle of life.

WHO CAN THIS SOMEBODY BE ?



Somebody crawls into mamma's
bed

Just at the break of day,
Snuggles up close and whispers
loud,

"Somebody's come to stay!"
Somebody rushes thro' the house,
Never once shuts a door,
Scatters his playthings all around
Over the nurs'ry floor.

Climbs on the fence and tears his
clothes—

Never a bit cares he,
Swings on the gate and makes
mud pies—

Who can somebody be?
Somebody looks with roguish eyes
Up through his tangled hair,
"Somebody's me," says he, "but
then
Somebody doesn't care."



THE BATTLE OF BLENHEIM

The great battle of Blenheim, a town on the River Danube, was fought on August 13th, 1704, Marlborough commanding the English army allied with the Germans against the French and Bavarians. It was "a famous victory," but 37,000 lives were lost. The poem was written by Robert Southey, who was made Poet Laureate of England in 1813, though we cannot call him a great poet. By means of a very simple talk between an old man and a little boy and girl, who had found the skull of one of the slain soldiers a hundred years after the battle, the poet shows us what a terrible curse is war.

It was a summer evening,
Old Kaspar's work was done,
And he before his cottage door
Was sitting in the sun;
And by him sported on the green
His little grandchild, Wilhelmine.
She saw her brother Peterkin
Roll something large and round,
Which he beside the rivulet
In playing there had found.
He came to ask what he had found,
That was so large, and smooth, and round.
Old Kaspar took it from the boy,
Who stood expectant by;
And then the old man shook his head,
And with a natural sigh —
" 'Tis some poor fellow's skull," said he,
" Who fell in the great victory."
" I find them in my garden, for
There's many here about;
And often when I go to plough
The ploughshare turns them out;
For many thousand men," said he,
" Were slain in that great victory."
" Now tell us what 'twas all about,"
Young Peterkin he cries,
And little Wilhelmine looks up
With wonder-waiting eyes.
" Now tell us all about the war,
And what they fought each other for."

" It was the English," Kaspar cried,
" Who put the French to rout;
But what they fought each other for
I could not well make out.
But everybody said," quoth he,
" That 'twas a famous victory."

" My father lived at Blenheim then,
Yon little stream hard by;
They burn'd his dwelling to the ground,
And he was forced to fly:
So with his wife and child he fled,
Nor had he where to rest his head."

" With fire and sword the country round
Was wasted far and wide;
And many a childing mother then
And new-born baby died:
But things like that, you know, must be,
At every famous victory."

" They say it was a shocking sight
After the field was won;
For many thousand bodies here
Lay rotting in the sun:
But things like that, you know, must be,
After a famous victory."

" Great praise the Duke of Marlbo' won,
And our good Prince Eugene."
" Why, 'twas a very wicked thung!"
Said little Wilhelmine.
" Nay, nay, my little girl," quoth he,
" It was a famous victory!"

" And everybody praised the Duke
Who this great fight did win."
" But what good came of it at last?"
Quoth little Peterkin.
" Why, that I cannot tell," said he,
" But 'twas a famous victory."



" 'Tis some poor fellow's skull," said he, " Who fell in that great victory."

FATHER WILLIAM

Robert Southey, in writing this poem, sought to illustrate the blessings of living a sober, industrious, virtuous life. He makes Youth ask of Age the way to live, and this is the only wise course. We should profit by the experience of those who have traveled the road of life before us.

"YOU are old, Father William," the young man cried,

"The few locks that are left you are grey ;
You are hale, Father William, a hearty old man ;
Now tell me the reason, I pray."

"In the days of my youth," Father William replied,

"I remembered that youth would fly fast ;
And abused not my health and my vigour at first
That I never might need them at last."

"You are old, Father William," the young man cried,

"And pleasures with youth pass away ;
And yet you lament not the days that are gone ;
Now tell me the reason, I pray."

"In the days of my youth," Father William replied,

"I remembered that youth could not last ;
I thought of the future, whatever I did,
That I never might grieve for the past."

"You are old, Father William," the young man cried,

"And life must be hastening away ;
You are cheerful, and love to converse upon death ;
Now tell me the reason, I pray."

"I am cheerful, young man," Father William replied ;

"Let the cause thy attention engage :
In the days of my youth I remembered my God,
And He hath not forgotten my age !"

THE LITTLE BUSY BEE

We cannot call this good poetry, nor can it be said to be remarkable for beauty of thought. But there is a certain quaintness of expression and simple truth in the verses, which were favorites with our forefathers. The writer was Dr. Isaac Watts.

HOW doth the little busy bee
Improve each shining hour,
And gather honey all the day
From every opening flow'r !

How skilfully she builds her cell !
How neat she spreads the wax !
And labours hard to store it well
With the sweet food she makes.

In works of labour or of skill,
I would be busy too ;
For Satan finds some mischief still
For idle hands to do.

In books, or work, or healthful play,
Let my first years be past,
That I may give for ev'ry day
Some good account at last.

A PSALM OF LIFE

A psalm is a song of praise or thankfulness. This noble poem, by Longfellow, is full of thanks to God for the good gifts of life. It counsels each one of us to do our best to-day, not to dream of to-morrow or to mourn for the past. "Let the dead Past bury its dead," means that we must resolutely turn our back on the past, do the duties that call us to-day, and march breast forward "with a heart for any fate."

TELL me not, in mournful numbers,
Life is but an empty dream !
For the soul is dead that slumbers,
And things are not what they seem.

Life is real ! Life is earnest !
And the grave is not its goal ;
"Dust thou art, to dust returnest,"
Was not spoken of the soul.

Not enjoyment, and not sorrow,
Is our destined end or way ;
But to act, that each to-morrow
Finds us farther than to-day.

Art is long, and Time is fleeting,
And our hearts, though stout and brave,
Still, like muffled drums, are beating
Funeral marches to the grave.

In the world's broad field of battle,
In the bivouac of Life,
Be not like dumb, driven cattle !
Be a hero in the strife !

Trust no future, howe'er pleasant !
Let the dead Past bury its dead !
Act—act in the living Present !
Heart within, and God o'erhead !

Lives of great men all remind us
We can make our lives sublime,
And, departing, leave behind us
Footprints on the sands of time—

Footprints, that perhaps another,
Sailing o'er life's solemn main,
A forlorn and shipwrecked brother,
Seeing, shall take heart again.

Let us, then, be up and doing,
With a heart for any fate ;
Still achieving, still pursuing,
Learn to labour and to wait.

THE MINSTREL BOY

Thomas Moore, the writer of this famous song, was an Irish poet, born in 1779, and died in 1852. He was a great favorite in his day, and published "Lalla Rookh," his most famous work, two years after the battle of Waterloo. "The Land of Song," mentioned in the following, means Ireland.

THE minstrel boy to the war has gone,
In the ranks of death you'll find him ;
His father's sword he has girded on,
And his wild harp slung behind him.
"Land of song !" said the warrior bard,
"Though all the world betrays thee ;
One sword, at least, thy rights shall guard,
One faithful harp shall praise thee !"

The minstrel fell, but the foeman's chain
Could not bring his proud soul under ;
The harp he loved ne'er spoke again,
For he tore its chords asunder ;
And said : "No chains shall sully thee,
Thou soul of love and bravery !
Thy songs were made for the pure and free,
They shall never sound in slavery !"

A CHILD'S EVENING PRAYER

The great poet knows the moods and moods of all ages, and can be as simple as a little child or as wise as the wisest scholar. Samuel Taylor Coleridge was a great poet, and here we see him uttering the thoughts of a little child in words which are beautiful in their simplicity.

ERE on my bed my limbs I lay,
God grant me grace my prayers to say !
O God, preserve my mother dear
In health and strength for many a year.
And O preserve my father too,
And may I pay him reverence due ;
And may I my best thoughts employ
To be my parents' hope and joy !
And O preserve my brothers both
From evil doings and from sloth,
And may we always love each other,
Our friends, our father, and our mother !
And still, O Lord, to me impart
An innocent and grateful heart,
That after my last sleep I may
Awake to Thy eternal day. Amen.

THE FAIRIES

Written by William Allingham, who died in 1889, this is one of the most beautiful poems about fairies. Grown-up people used to believe in fairies, and in Ireland, not so very long ago, grown-ups would talk about fairies just as children do, so that Allingham, who, though his parents were English, was born in Ireland, no doubt got to know and love the "wee folk" by living in Ireland.

UP the airy mountain,
Down the rushy glen,
We daren't go a-hunting,
For fear of little men ;
Wee folk, good folk,
Trooping all together ;
Green jacket, red cap,
And white owl's feather !

Down along the rocky shore
Some make their home,
They live on crispy pancakes
Of yellow tide-foam ;
Some in the reeds
Of the black mountain-lake,
With frogs for their watch-dogs,
All night awake.

High on the hill-top
The old King sits ;
He is now so old and gray,
He's nigh lost his wits.
With a bridge of white mist
Columbkille he crosses,
On his stately journeys
From Slieveleague to Rosses ;
Or going up with music
On cold starry nights,
To sup with the Queen
Of the gay Northern Lights.

They stole little Bridget
For seven years long ;
When she came down again,
Her friends were all gone.
They took her lightly back,
Between the night and morrow ;
They thought that she was fast asleep,
But she was dead with sorrow.
They have kept her ever since
Deep within the lake,
On a bed of flag-leaves,
Watching till she wake.

By the craggy hill-side,
Through the mosses bare,
They have planted thorn-trees
For pleasure here and there.
Is any man so daring
As dig them up in spite,
He shall find their sharpest thorns
In his bed at night.

Up the airy mountain,
Down the rushy glen,
We daren't go a-hunting,
For fear of little men ;
Wee folk, good folk,
Trooping all together ;
Green jacket, red cap,
And white owl's feather !

COLUMBUS¹

This poem with its wonderful watchword of endurance, "Sail on ! sail on !" is one of our greatest American poems. The unconquerable spirit of the discoverer of our land has become the watchword of the Republic.

BEHIND him lay the gray Azores,
Behind the gates of Hercules ;
Before him not the ghost of shores,
Before him only shoreless seas.
The good mate said : " Now must we pray,
For lo ! the very stars are gone ;
Speak, Admiral, what shall I say ? "
" Why say, sail on ! and on ! "

" My men grow mut'nous day by day ;
My men grow ghastly wan and weak."
The stout mate thought of home ; a spray
Of salt wave wash'd his swarthy cheek.
" What shall I say, brave Admiral,
If we sight naught but seas at dawn ? "
" Why, you shall say at break of day :
' Sail on ! sail on ! and on ! '"

They sailed, and sailed, as winds might blow,
Until at last the blanch'd mate said :
" Why, now, not even God would know
Should I and all my men fall dead.
These very winds forget their way,
For God from these dread seas is gone.
Now speak, brave Admiral, and say—"
He said : " Sail on ! and on ! "

They sailed, they sailed, then spoke his mate :
" This mad sea shows his teeth to-night,
He curls his lip, he lies in wait,
With lifted teeth as if to bite !
Brave Admiral, say but one word ;
What shall we do when hope is gone ? "
The words leaped as a leaping sword :
" Sail on ! sail on ! and on ! "

Then, pale, and worn, he kept his deck,
And thro' the darkness peered that night.
Ah, darkest night ! and then a speck—
A light ! a light ! a light ! a light !
It grew—a star-lit flag unfurled !
It grew to be Time's burst of dawn.
He gained a world ! he gave that world
Its watch-word : " On ! and on ! "

¹ Copyright, 1897, by the Whitaker & Ray Co. San Francisco, publishers of Joaquin Miller's Poems.

THE TWENTY-THIRD PSALM

The Psalms of David in the Bible are among the finest poetry we can read. Many of the other books in the Bible are also poetic in form, but we do not usually think of them as poems. They are not in verse. More than two hundred years ago, a Poet Laureate, named Nahum Tate, re-wrote them with rhyme, and his verses are still sung; but he was a poor poet. Joseph Addison was a far greater man, and the 23rd Psalm here given was turned into verse by him.

THE Lord my pasture shall prepare,
And feed me with a shepherd's care;
His presence shall my wants supply,
And guard me with a watchful eye;
My noonday walks He shall attend,
And all my midnight hours defend.

When in the sultry glebe I faint,
Or on the thirsty mountains pant,
To fertile vales, and dewy meads,
My weary, wandering steps He leads,
Where peaceful rivers, soft and slow,
Amid the verdant landscape flow.

Though in the paths of death I tread,
With gloomy horror overspread,
My steadfast heart shall fear no ill,
For Thou, O Lord, art with me still:
Thy friendly crook shall give me aid,
And guide me through the dreadful shade.

Though in a bare and rugged way,
Through devious lonely wilds I stray,
Thy bounty shall my pains beguile;
The barren wilderness shall smile,
With sudden greens and herbage crown'd,
And streams shall murmur all around.

RULE, BRITANNIA!

This famous song, which is known wherever the British flag waves, was first sung in the year 1740, in a little play, or masque, performed before the Prince and Princess of Wales of that time. As the masque was written by two Scottish poets, named James Thomson and David Mallet, the song has been claimed for both; but it is usually thought that James Thomson, who was a good poet, if not a great one, was the author. "Rule, Britannia!" is not the finest poetry, but it is full of pride and the spirit which has made England one of the greatest of nations.

WHEN Britain first, at Heaven's command,
Arose from out the azure main,
This was the charter of her land,
And guardian angels sung the strain:
Rule, Britannia! Britannia rules the waves!
Britons never shall be slaves.

The nations not so blest as thee,
Must in their turn to tyrants fall;
Whilst thou shalt flourish, great and free,
The dread and envy of them all.

Still more majestic shalt thou rise,
More dreadful from each foreign stroke;
As the loud blast that tears the skies
Serves but to root thy native oak.

Thee haughty tyrants ne'er shall tame;
All their attempts to bend thee down
Will but arouse thy generous flame,
And work their woe and thy renown.

To thee belongs the rural reign;
Thy cities shall with commerce shine;
All thine shall be the subject main,
And every shore it circles thine.

The Muses, still with freedom found,
Shall to thy happy coast repair;
Blest Isle, with matchless beauty crown'd,
And manly hearts to guard the fair.
Rule, Britannia! Britannia rules the waves!
Britons never shall be slaves.

A CHILD'S THOUGHT OF GOD

Elizabeth Barrett Browning, the author of these beautiful verses, was a great poetess and the wife of Robert Browning, a great poet. Her pure and simple mind enabled her to see things with the clearness of a child's faith, and her power of words to express herself in noble poetry. Here she gives a wonderful idea of God's constant care and watchfulness over those of us who seek to do His will.

THEY say that God lives very high!
But if you look above the pines
You cannot see our God. And why?

And if you dig down in the mines
You never see Him in the gold,
Though from Him all that's glory shines.

God is so good, He wears a fold
Of heaven and earth across His face—
Like secrets kept, for love untold.

But still I feel that His embrace
Slides down by thrills, through all things
made,
Through sight and sound of every place:

As if my tender mother laid
On my shut lids her kisses' pressure,
Half waking me at night and said:
"Who kissed you through the dark, dear
guesser?"

BABY

George Macdonald, who wrote this little poem about the wonder of baby's first appearance, was a famous writer of stories, but loved best of all to make poems about childhood, and we shall have to take other flowers from him on our way through the garden of English poetry. It is printed by permission of the publishers, Messrs. Chatto & Windus.

WHERE did you come from, baby dear?
Out of the Everywhere into here.

Where did you get those eyes so blue?
Out of the sky as I came through.

What makes the light in them sparkle and spin?
Some of the starry twinkles left in

Where did you get that little tear?
I found it waiting when I got here.

What makes your forehead so smooth and
high?
A soft hand stroked it as I went by.

What makes your cheek like a warm white
rose?
I saw something better than any one knows.

Whence that three-cornered smile of bliss?
Three angels gave me at once a kiss.

Where did you get this pearly ear?
God spoke, and it came out to hear.

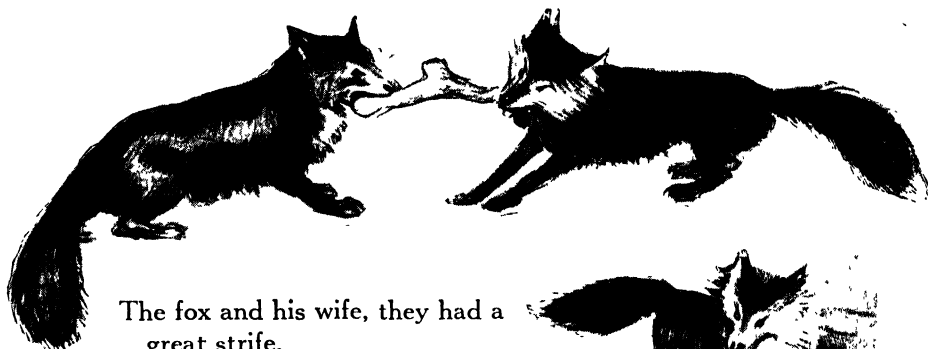
Where did you get those arms and hands?
Love made itself into bonds and bands.

Feet, whence did you come, you darling
things?
From the same box as the cherub's wings.

How did they all just come to be you?
God thought about me, and so I grew.

But how did you come to us, you dear?
God thought about you, and so I am here.

THE FOX AND HIS WIFE, THEY HAD A GREAT STRIFE



The fox and his wife, they had a
great strife,
They never eat mustard in all
their whole life;
They eat their meat without fork or knife,
And long to be picking a bone, e-ho!



The fox jumped up on a moonlight night;
The stars they were shining, and all things
bright;
"Oh, ho!" said the fox, "it's a very fine
night
For me to go through the town, e-ho!"

The fox when he came to the yonder stile,
He lifted his lugs and he listened awhile!
"Oh, oh," said the fox, "it's but a short mile
From this unto yonder wee town, e-ho!"

The fox when he came to the farmer's gate,
Who should he see but a farmer's drake;
"I love you well for your master's sake,
And long to be picking your bone, e-ho!"





The grey goose she ran round the
haystack,
"Oh, oh!" said the fox, "you are very
fat;
You'll grease my beard and ride on
my back
From this into yonder wee town, e-ho!"



Old Gammer Hipple-hopple hopped
out of bed,
She opened her casement, and popped
out her head;

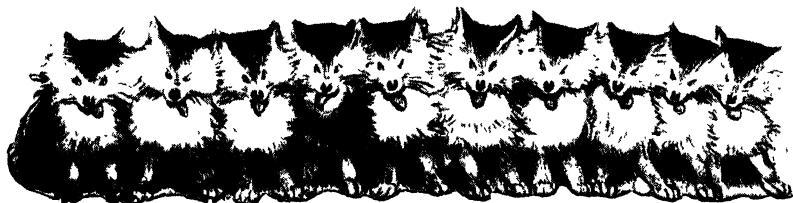
"Oh, husband, oh, husband,
the grey goose is dead.
And the fox is gone through
the town, oh!"



Then the old man got up in
his red cap,
And swore he would catch the
fox in a trap;
But the fox was too cunning,
and gave him the slip.
And ran through the town,
the town, oh!

When he got up to the top of the
hill,
He blew his trumpet both loud and
shrill,
For joy that he was safe
Through the town, oh!

When the fox came back to his den,
He had young ones both nine and ten,
"You're welcome home, daddy, you may
go again,
If you bring us such nice meat
From the town, oh!"



LITTLE VERSES FOR VERY LITTLE PEOPLE

LITTLE Polly Flinders,
Sat among the cinders,
Warming her pretty little toes ;
Her mother came and caught her,
And whipped her little daughter
For spoiling her nice new clothes.

MISS KITTY was rude at the table
one day,
And would not sit still on her seat ;
Regardless of all that her mother could
say,

From her chair
little Kitty kept
running away
All the time they
were eating their
meat.



As soon as she saw that the beef was
removed,
She ran to her chair in great haste ;
But her mother such giddy behavior
reproved
By sending away the sweet pudding she
loved,
Without giving Kitty one taste.

ROWLEY POWLEY, pudding and pie,
Kissed the girls and made them cry ;
When the girls came out to play,
Rowley Powley ran away.

THERE was an old man in a tree,
Who was horribly bored by a bee ;
When they said, " Does it buzz ? "
He replied, " Yes, it does !
It's a regular brute of a bee ! "



THERE was a little girl, who had a
little curl,
Right in the middle of her forehead ;
When she was good, she was very, very
good,
But when she was bad, she was horrid.

One day she went upstairs, while her
parents, unawares,
In the kitchen down below were
occupied with meals ;
And she stood upon her head, on her
little truckle bed,
And she then began hurrayng with
her heels.

Her mother heard the noise, and thought
it was the boys
A-playing at a combat in the attic ;
But when she climbed the stair, and
saw Jemima there,
She took and she did whip her most
emphatic.



A FRENCH FLEET SEARCHES IN VAIN FOR LOUISIANA



La Salle, the first commander of Fort Frontenac, learned a great deal of the western country from the Indian traders. He had already traveled to the Ohio and in 1681 he set out again and journeyed up the lakes until he reached the site where Chicago now stands. From that place he and his men set out for the Illinois. They went down that river to the Mississippi, and floated down the Mississippi to the Gulf of Mexico. After that La Salle went back to France, and was sent out again to found a city on the Mississippi. But he could not find the river from the Gulf, and his men mutinied and killed him. This picture shows the search for the river.

The Book of CANADA

THE HISTORY OF CANADA

IN volume one you found a general description of the great continent of North America, and also some pages and pictures telling of our part of this great division of the earth's surface. Now we shall begin to tell you more of our great Dominion. Much of its early history will also be told under the heading, United States. We shall find that England and France for more than a hundred years struggled for the possession of the St. Lawrence River, and for the right to take furs and fish. For a time it seemed that France would not only hold possession of Canada, but would also control the whole of the Mississippi Valley to the south of us as well. Finally the French power was overcome, but not until after a bloody war, of which you are about to learn.

FRENCH CANADA BEFORE THE CONQUEST

KING HENRY

VII of England, not wishing to see Spain reap all the profits in the New World, signed a patent in 1496, in favor of John and Sebastian Cabot, for the discovery and conquest of new lands. In 1497, John Cabot reached North America—probably Newfoundland or Cape Breton. The next year he sailed again and this time coasted down the rocky, mountainous shore of Labrador.

CORTEREAL, THE SLAVE TRADER

Portugal also wished to share in the spoils of the New World, so in 1500, Gaspar Cortereal, one of her greatest sea captains, was sent on a voyage of discovery. He landed on the coast of Labrador and seized a number of natives, embarked them on two of his ships and sent them back to Lisbon, to be sold as slaves. He, himself, set out for home in the third ship at the same time, but was never heard of again. His brother sailed the next year to search for him, but he too was lost, and these disasters ended the Portuguese attempts at discovery in America.

The next comers were the French, who were the first to make a real settlement on the northern continent.

The first Frenchmen to visit America were not ambitious explorers or seekers after gold. They were simple seafaring Norman and Breton fish-

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men who came to gather a harvest of fish from the teeming cod banks of Newfoundland. We have proof that these daring fishermen sailed their little fishing vessels to the banks shortly after Columbus discovered America.

VERRAZANO, THE FLORENTINE, MAKES A VOYAGE UP THE COAST

King Francis I of France, however, was not satisfied with the modest spoils of his fishermen. He had his ambitions aroused by the great claims of Spain and Portugal in the New World, and in 1523, he sent out an expedition under Verrazano.

This explorer visited Florida and sailed up the American coast to Maine. He took formal possession of the country for his royal master and called it La Nouvelle France. King Francis was so well pleased with the success of the expedition that he fitted out another. But no tidings were ever received from Verrazano or from any of his men.

JACQUES CARTIER OF ST. MALO, THE MASTER PILOT

On account of troubles at home, it was ten years before King Francis could again turn his attention to America. In 1534, he gave his assent to the equipment of an expedition. Its command was given to Jacques Cartier of St. Malo, a hardy mariner who had often visited the fishing banks of New-

foundland. In the early summer, Cartier sailed from St. Malo with two small vessels and one hundred and twenty men. Twenty days later, the coast of Newfoundland was reached and the tiny barks passed through the Straits of Belle Isle into the Gulf of St. Lawrence. Circling round, they passed close to the New Brunswick shore. In July, they entered the Chaleur Bay and Cartier landed on its coast at Gaspé. He took formal possession of the country in the name of the French king and erected a large wooden cross as a sign of French sovereignty. Though he crossed to the island of Anticosti, he did not enter the St. Lawrence River, and on the 25th of July, he sailed for France, taking with him two natives whom he had kidnapped while at Gaspé.

CARTIER SAILS UP THE ST. LAWRENCE AND DISCOVERS "CANADA"

The following May, Cartier embarked again for the New World. On the tenth of August his ships sailed into the St. Lawrence, so called because it was discovered on the feast day of the saint bearing that name. Guided by two savages, he sailed up the river to an island, since named Isle d'Orleans. His native guides told him that the country was divided into three districts—Hochelaga, Canada and Saguenay. Here first we meet the name now borne by the Dominion. It is a word of Iroquois origin, meaning in the native tongue a collection of Indian dwellings.

CARTIER DISCOVERS BEAUTIFUL MONT ROYAL

Above the island and nestling at the foot of a mighty rock on which the citadel of Quebec now stands was the little Indian village of Stadacona. The natives, who had never before seen a white man, were very friendly. Donnacona, the chief, told the adventurers wonderful tales of the river, and its shores, and Cartier determined to explore it. Leaving his ships at the St. Charles River, he set out with fifty of his men in a pinnace. They rowed up the mysterious river till they reached the first hill of any size that they had seen since leaving Stadacona. This mountain, Cartier called Mont Royal. Its wooded crest now towers above the city of Montreal. Along the shore, sheltered from the northern blasts, was the town of Hochelaga. It was composed of about fifty tunnel-like dwellings and surrounded by a strong wall of logs.

The bearded white men with their resounding trumpets were received with a mixture of awe and delight. They were thought to have come from heaven. The half-naked Indians brought all their sick to be healed, and on leaving Cartier was showered with gifts of fish and corn.

THE HORRORS OF THAT CANADIAN WINTER

Cartier found that he could not get his boat past the rapids at Lachine, and was forced to return to Stadacona. By this time it was too late to attempt to cross the Atlantic, so he resolved to pass the winter in Canada, and his men built a rude fort and surrounded it with palisades. They were ill provided with food, however, and in December, scurvy of a violent nature broke out among the French. Of the one hundred and ten men, for some time, not more than three or four were free from the disease. Twenty-six men died before April, and most of the others were at death's door, when an Indian gave Cartier a native medicine which cured the ailing Frenchmen. When spring returned, they sailed for France, and took with them for presentation to the French king Chief Donnacona and several of his tribe whom they had treacherously seized.

THE FIRST SETTLEMENT BY WHITE MEN IN THE NORTH

On arriving home, Cartier found his country distracted by religious dissensions and at war with Charles V. Amid such troubles, he found his presence unheeded and his projects disregarded. The existence of Canada seemed to be ignored by king and country alike, and it was 1540 before Francis I could again listen to proposals concerning it. Many of his subjects were opposed to settlements, claiming that the weather was too cold and that gold and silver mines did not exist. However it was finally decided that a profitable trade in furs could be obtained and that it was unwise to allow the other European countries to share the spoils of the New World among them.

The king by royal edict, dated June 15, 1540, gave Seigneur de Roberval the right to raise a body of volunteers to make a permanent settlement in the New World, and Cartier was given the command of the vessels which were to convey the colonists to America. With a part of the little squadron he sailed early in the summer of 1541, and after a three

months' stormy voyage he reached Newfoundland, where he awaited the arrival of Roberval. He failed to appear, so Cartier continued his voyage, and cast anchor at Quebec, where the colonists landed and began to clear land for cultivation. Leaving his men thus employed, he ascended the river, hoping to get beyond the Sault St. Louis, but found it impossible to clear the falls.

Roberval did not put in an appearance, and Cartier prepared to pass the winter in the country. He sent two of his vessels to St. Malo to inform the king of his work and to inquire what had delayed Roberval.

In the spring, the Indians became unfriendly, and he sailed with all his colonists for home. About the same time, Roberval left France. The two small squadrons met off the shores of Newfoundland, but Cartier refused to turn back and continued his homeward voyage.

Roberval sailed on to Stadacona and made preparations for the coming winter. Before spring, fifty of his men had perished. During the summer, the king, instead of sending aid, ordered Cartier to go and bring Roberval back, as his services were needed in the war that was about to be declared. All the survivors were taken back to France, and thus ended the first attempt at colonization.

HOW THE GREAT FUR TRADE WAS COMMENCED BY FISHERMEN

During the remaining years of the sixteenth century, France was engaged in war and did not have the time to think of New France, and the red-skinned Canadians were left undisputed masters of their forests. Yet the Banks of Newfoundland were visited yearly by French fishermen, some of whom found it profitable to spend part of their time in exchanging gifts with the Indians for furs. These furs were sold at a handsome profit and it was not long before many fishermen devoted their entire time to the fur traffic. It attracted other adventurers, and by the end of the century a somewhat extensive trade in furs had been established.

SETTLEMENT AT TADOUSSAC A FAILURE

At length the fur trade attracted attention, and Pont-Gravé, a rich merchant of St. Malo, with two others, obtained a monopoly from the king, and Pont-Gravé sailed in the early summer of 1599 to

establish a trading-post in Canada. Tadoussac, at the mouth of the Saguenay, a favorite meeting place of many tribes of Indians, was chosen, and sixteen men were left to hold the place during the winter. But they had not yet learned to make proper provision for the cold months and in the spring only two survivors were found. They, too, would have perished if they had not been cared for by friendly Indians. Thus the attempt at settlement ended in failure, and Tadoussac became a mere summer trading-post.

CHAMPLAIN, THE FOUNDER OF NEW FRANCE

Two years later, a trading company, having secured the fur monopoly, fitted out an expedition for Canada. Captain Samuel Champlain, a distinguished naval officer, was invited to command the expedition, and with three vessels he set sail in 1603. Accompanied by Pont-Gravé, he ascended the River St. Lawrence as far as the Sault St. Louis. Upon his return to France, his report so pleased King Henry that he promised to give all possible assistance to building up French interests in Canada.

THE FOUNDING OF THE COLONY OF ACADIA

The fur monopoly was now granted to Sieur de Monts, who had been one of the associates of Pont-Gravé. De Monts was an old friend of Henry IV of France, and through his influence it was ordered that all Huguenots were to enjoy religious freedom in the New World.

In March, 1604, de Monts and Champlain sailed with emigrants for Acadia. They passed along the coast and discovered the two rivers, St. John and St. Croix, and on an islet at the mouth of the latter river de Monts decided to land his colonists. During the winter, thirty-six of his men died from scurvy. As soon as spring arrived, he set out in search for a more suitable place. On his return from a coasting voyage to Cape Cod he found that Pont-Gravé had arrived with forty colonists. This reinforcement raised the spirits of all. With fresh courage for the struggle, they finally chose a new home, and a small town was built and named Port Royal. The little colony flourished, but the spring of 1607 brought bad news. De Monts had lost his monopoly and the colonists were forced to abandon Port

Royal and return to France. Poutrincourt in 1610 came over to Acadia with a fresh supply of colonists. He found the old buildings still standing and the natives were delighted at the return of the French.

THE SMALL BEGINNING OF A FAMOUS CITY

Champlain was chosen to settle a colony on the St. Lawrence as a base for further exploration. He left France in 1608 and reached the spot where Cartier had spent two winters. Champlain found that the village of Stadacona had been destroyed. The place was deserted and upon the site he laid the foundation of Quebec, which means a strait.

A SUCCESSFUL WAR THAT PROVED TO BE A COSTLY BLUNDER

During the year 1609 occurred an event which was the main cause of the prolonged and the bloody conflict between the Iroquois and the French. Champlain took up the cause of the Algonquins, with whom the Iroquois were at war, and left Quebec with a few Frenchmen and a flotilla of canoes filled with Indians to attack the Iroquois. A large body of water was discovered, afterwards called Lake Champlain, and upon its shores he met two hundred of the fiercest and bravest Iroquois. The war-whoop of the Indians was met by a discharge from Champlain's matchlock, and mistaking the flash for lightning, the superstitious Indians fled. The next year Champlain defeated them in a pitched battle at the mouth of the Richelieu, and from this time until Canada became an English colony, the powerful Iroquois were always the bitterest enemies of the French.

CHAMPLAIN A GREAT EXPLORER AND A LAWGIVER

In 1613, Champlain with five companions and two canoes paddled up the Ottawa River to Rideau Falls. Two years later, he made another expedition further up the Ottawa, reached Mattawa, crossed by a short portage into Lake Nipissing and then descended the French River into Lake Huron. In September, he led a large party of the Hurons down the River Trent into Lake Ontario. There the Indians made an attack on a well-palisaded town of the Oneida Indians and were repulsed. Champlain was wounded and as a result lost his great prestige.

In 1621, Champlain issued a number of ordinances for securing peace and order

in the colony. This collection forms a kind of code and was the first that Canada possessed.

THE "COMPANY OF THE HUNDRED ASSOCIATES"

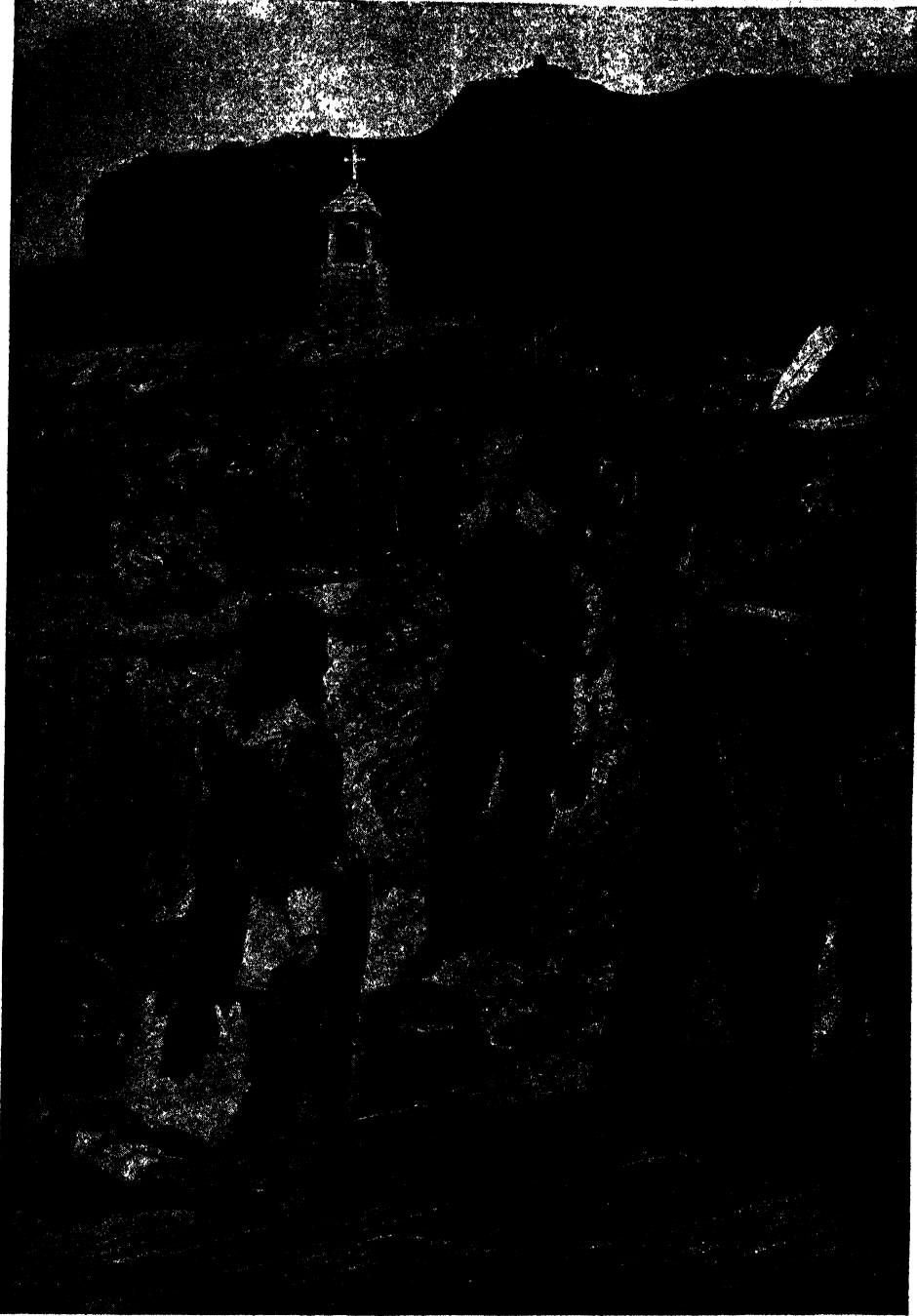
In 1627 an important step for the future of the new colony was made. Up to this time the colonists had devoted almost their entire time to the fur trade. Very little had been done towards clearing the forests and tilling the soil and the great Cardinal Richelieu determined that more attention should be paid to colonization. To help in carrying out his plans, he formed a new company of traders under the name of The Company of New France, more commonly called the Company of the Hundred Associates. Richelieu granted to its members the monopoly of trade and the power to govern New France and Florida, and the king gave the company two ships and made twelve of its chief members nobles. In return for these privileges, the company undertook to send out four thousand settlers during the next fifteen years, with the agreement that each colonist should be of French birth and a Catholic. Thus did Canada pass once more from a royal to a commercial regime.

QUEBEC BECAME FOR THREE YEARS AN ENGLISH PROVINCE

Charles I of England took up the cause of the Huguenots and declared war against France. A fleet of war vessels was equipped in England to invade the settlements of New France and attack Quebec. In the summer of 1628, the English vessels reached the Gulf of St. Lawrence. They captured several French vessels laden with fish and furs. Then they met and defeated a French fleet sent over by the Hundred Associates with colonists and supplies for Quebec. Kirke, the English commander, satisfied with his success, returned to England. Quebec, deprived of its supplies, had a very hard winter, and when Kirke returned the following spring, it surrendered.

During the following three years Quebec was occupied by an English garrison, and the soldiers made much profit out of the fur trade with the Indians. The war, however, between England and France was brought to a close by the Treaty of St. Germain-en-Laye (1632). By the terms of the treaty New France and Acadia were given back by England and Champlain was restored to his post.

PLANTING THE BRITISH FLAG IN CANADA



It was in 1492 that Columbus found America where he sought India. Five years later Englishmen, under Cabot, discovered Newfoundland, and French fishermen went there to catch cod. From there they reached Canada, and in 1534 Jacques Cartier arrived at what is now Newfoundland. He made two other journeys to Canada, claiming it for France. Then Frenchmen tried to settle there, but it was not until Samuel de Champlain was sent out by Henry IV. of France, in 1608, that the French colonists succeeded. Champlain explored and founded settlements, and did his best for the natives, but he was not supported by his king, and in 1629 an English force took him prisoner and sent him to England. Here we see him surrendering to the English. He was later released, and died in Canada in 1635, after it was restored to the French.

NEW FRANCE MADE A ROYAL PROVINCE

The history of the country from 1633 to 1663 is but the history of the fur trade, the Jesuit missions and the struggle against the Iroquois. The Company of the Hundred Associates devoted all its time to the fur trade and paid little heed to colonization. Because it did not carry out this part of its agreement, the king in 1663 cancelled its charter and New France was made a royal province.

THE FRENCH AND ENGLISH BECOME RIVALS

Meantime the English had gained a footing on the continent and rivalry had sprung up between the two nations, each of which desired from the beginning to force the other out. The first clash came as early as 1613 when Samuel Argall set out from Virginia with an expedition to drive the French from Acadia. Port Royal was pillaged and the crops in the fields destroyed. As a result of this raid, Great Britain began to press her claims upon Acadia. After 1614, the land which King James of England had granted to the Plymouth Company between the forty-fifth and forty-eighth parallels of latitude was called New England. There was now a New England and a New France, and Sir William Alexander, a loyal Scotchman, decided there should also be a New Scotland. From the king he obtained, in 1621, a grant of the whole of Acadia under the general name of New Scotland or Nova Scotia. Charles I renewed Alexander's charter and later established the Order of Baronets of Nova Scotia, each member of which, in return for a pledge to make actual settlements in the colony, received an estate of eighteen square miles. Admiral Kirke, in 1628, declared Acadia to be under the rule of Sir William Alexander's Company, but the company did not prosper and by the treaty of 1632 Acadia was restored to France. The forces of Oliver Cromwell conquered the colony in 1654, but it was again restored to France by his successor.

HOW CANADA AS A FRENCH COLONY WAS GOVERNED

Under the new system of royal government, the three most important persons in New France were the governor, the intendant and the bishop. The governor was the official head of the colony and through him all negotiations with the In-

dian tribes and with the English colonies were conducted. In addition to the governor-general there were local governors at Montreal and Three Rivers. The intendant had charge of justice, police and finances, and may be called the king's business manager for the province. The bishop was the head of the Church. These three, together with a body of councillors, at first five, afterwards seven, and finally twelve, formed the Sovereign Council, of which the name was afterwards changed to Superior Council. This council was a legislative body and a court of justice, and was bound to enforce the edicts of the king. This form of government caused much friction and there were many bitter disputes between the governor-general, the intendant and the council. As the king, three thousand miles away, was the only one to decide these disputes, a strife would frequently last for months.

THE SEIGNIORIAL SYSTEM UNDER WHICH CANADA WAS SETTLED

The system adopted to advance settlement was a mild form of feudalism, which was called the seigniorial system. Under this, the king granted large tracts of land to a few gentlemen, who each undertook to provide a certain number of armed men for the defence of the colony. Out of their large estates the seigniors made small grants to retainers, who in Canada were called *habitants*. The *habitants* owed military service to the seigniors, just as the seigniors owed service to the king, and in this way the seigniors had an armed force at their call. The seignior was required to keep a mill to grind flour and meal for his tenants, but in return, he took a toll of the flour and meal. The *habitants* owed a certain number of days of free service each year to the seignior, and paid him a fine on every sale of land, while if the seignior sold his land, or if he inherited property, except from his father or mother, the king claimed a part of the purchase money or the value of the land as his due.

In 1672 there arrived at Quebec the most famous of all the governors of New France—Louis de Buade, Count de Frontenac, called by the Indians the Great Onontio. He determined to compel the Indians to sell their furs to the French rather than to the English, who were trying to gain a share in the fur trade, and accordingly, in 1673, he built Fort Fronte-

nac where Kingston now stands, to intercept the fur trade. The great explorer, La Salle, was the first commander of the fort, and started from it on his journey to the Mississippi.

WAR BETWEEN FRENCH AND ENGLISH AND THE LOSS OF ACADIA

From 1694, the French settlement continued to increase and aroused the jealousy of the English colonists to the south. Both parties, aided by the Indians, carried on a destructive border warfare.

In 1703, there broke out in Europe the War of the Spanish Succession, and the war soon led to hostilities in America. Several unsuccessful attempts were made by the New Englanders to take Acadia, and finally, in 1710, an expedition under Nicholson was sent on this mission. Port Royal with little resistance was taken, and this meant the capture of Acadia, which thus passed for ever out of the hands of the French. The following year the English under Admiral Walker failed in an attack on Quebec. The Peace of Utrecht (1713) brought peace for a time to America. By its terms, France abandoned all claims to Hudson Bay, Acadia and Newfoundland, but retained Cape Breton, Prince Edward Island and certain fishing privileges off Newfoundland.

HOW THE FORTRESS OF LOUISBOURG WAS CAPTURED

During the thirty years peace that followed, the English and the French in America were constantly on the verge of war. The French chose Louisbourg as a seat of government and at once commenced to fortify it.

Early in 1744, news reached the New World that war had been declared between England and France. In a few months, American waters swarmed with French privateers, for which the harbor at Louisbourg provided a safe refuge, and the New Englanders determined that the town should be destroyed, and for that purpose fitted out an expedition. Under the leadership of William Pepperell it left Boston on the last day of March, 1745, and joined the English fleet under Admiral Warren. Louisbourg was besieged, and after a brave defence which lasted for seven weeks the town surrendered. A series of raids and counter-raids followed, but this border warfare was interrupted by the Peace of Aix-la-Chapelle (1748), by which Cape Breton and the captured fortress of Louisbourg were restored.

GENERAL BRADDOCK FAILS TO DRIVE THE FRENCH OUT OF OHIO VALLEY

The peace was but a truce, hostilities hardly ceasing in America. Beyond the Alleghanies English traders had pushed their way into the Ohio Valley, which was claimed by the French. The French objected and determined to fortify the Ohio Valley by a line of forts. The English decided to drive their enemies out of the valley, and General Braddock, at the head of an English army, was sent out to do this work. His campaign was a disastrous failure.

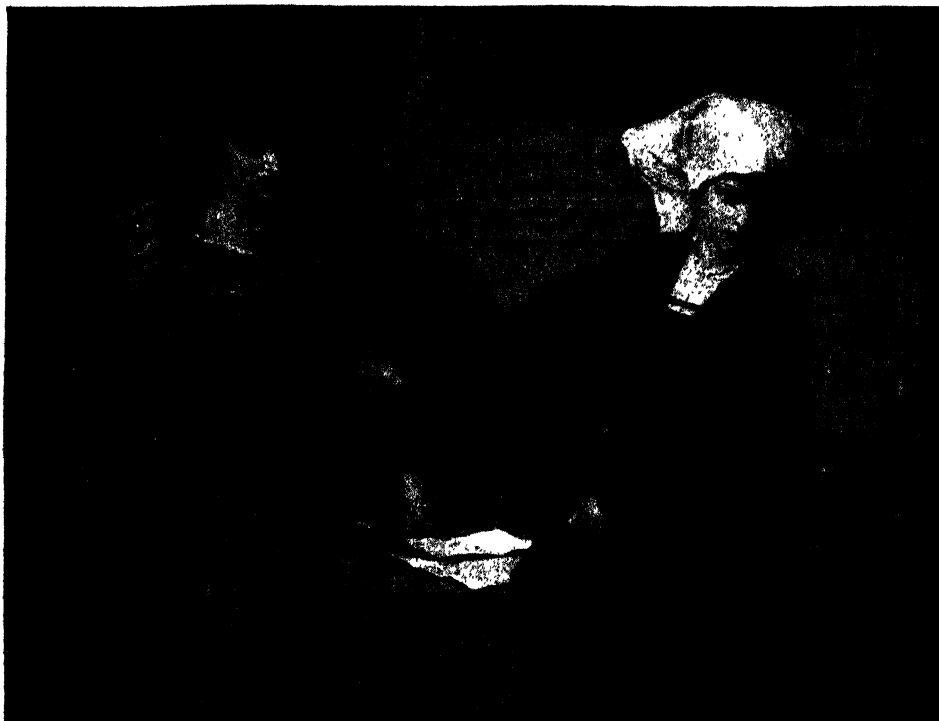
Louis XV, on the eve of war in Europe, could spare but few troops, but he sent to command his little army in America one of his bravest soldiers, the Marquis de Montcalm, who arrived in Canada in May, 1756, the same month that war was declared between his country and England. Both sides were very active in preparing for the coming struggle. In August, Montcalm captured Oswego, and followed this up by taking Fort William Henry, but on the other hand the English captured Louisbourg and destroyed it.

THE FALL OF QUEBEC AND THE DEATH OF TWO GREAT SOLDIERS

The British now prepared for a supreme effort to take New France and Lord Amherst was ordered to march on Montreal while General Wolfe was sent to capture Quebec. The fleet which bore Wolfe and his men reached the Isle d'Orleans near the end of June. His land force numbered less than nine thousand men while Montcalm, who had taken vigorous measures for the defence of the city, and held almost an impregnable position, had five thousand more. It was Wolfe's plan at first to tempt his opponent to battle but in this he failed, and he decided to stake everything upon an attempt to scale the Heights of Abraham. The plan succeeded, and as morning broke on the thirteenth of September, 1759, the British troops stood on the Plains of Abraham and faced the French army. But charging at the head of his grenadiers, Wolfe was fatally wounded and with the din of victory ringing in his ears he died. In the rout which followed, Montcalm was wounded, and he, too, died the following day. The following year Montreal was captured, and this closed the struggle. By the Treaty of Paris (1763) Canada remained a British colony.

THE NEXT STORY OF CANADA IS ON PAGE 755.

TWO SCENES FROM SHAKESPEARE'S PLAYS



CLAUDIO'S SISTER SHRINKS FROM ANGELO'S SUGGESTION THAT SHE WED HIM



PRINCE FLORIZEL AND LEONTES' LOVELY DAUGHTER PERDITA

The Story of FAMOUS BOOKS

THE PLAYS OF SHAKESPEARE

IN our last readings of the stories from Shakespeare's plays we had chiefly sad stories, or tragedies; so we turn now for a change to some happy tales or comedies. There is both sorrow and joy in life, and in our reading we should seek to vary the subject by choosing now tragedy and now comedy, and not always to read one sort of tale, as that would give us a wrong idea of life. As we saw in the story of "Othello" the unhappy ending of a hasty man's jealousy, we are now to see how the same folly may end not unhappily, for "A Winter's Tale," like "A Midsummer Night's Dream," is a delightful piece of fancy and imagination; just the sort of story that we love to tell at a winter fireside. "Measure for Measure" is also a fine comedy that teaches us useful lessons of conduct; while the charming comedy of "Much Ado about Nothing," like "A Winter's Tale," shows how foolish it is to pay any attention to the tongues of slanderers.

MEASURE FOR MEASURE

IN olden times there was a Duke of Vienna whose good-natured treatment of his people had not been to the advantage of his state. The laws of the city not being strictly enforced, as all laws should be, people stood in no fear of them. The Duke saw that for his people's good the laws would have to be kept, but at the same time he did not wish to appear suddenly to change from a kind ruler into a tyrant. He had, therefore, to think of some way to carry out his reform without appearing to have lost his kindly interest in his subjects.

Among the noblemen of Vienna was one Angelo, a stern, severe, and cold-hearted man. The Duke, thinking that Angelo would be just the man to enforce the laws, appointed him Lord Deputy, and gave out a report that he himself was leaving for a time to visit another country. Instead of going away, however, he assumed the habit of a monk, and, thus disguised, remained in Vienna to see how Angelo conducted himself.

As chance would have it, the first case to call for Angelo's judgment was that of Claudio, a young gentleman who had secretly married a young lady named Juliet. In those days, and still in many parts of Europe, a bride had to bring her husband a marriage dower, a gift of money or land, presented by her parents or relatives. Claudio and

CONTINUED FROM 450



Juliet were keeping their marriage secret until it was known what fortune her relatives would fix for her dower. For this Claudio was condemned to death, a sentence which was an outrage, but Angelo was keen to exercise his new power, like all persons "drest in a little brief authority."

Claudio had a sister who, when this misfortune befell her brother, had but newly entered a convent, and on news of the impending execution of her brother reaching her, retiring and gentle though she was, she took courage to go forth and intercede with Angelo herself on behalf of Claudio.

Although the Lord Deputy was a cold and cruel man, he was not insensible to the winning beauty of Isabella, as Claudio's sister was named, and her appeal seemed to soften him; but that was only because a selfish desire to possess the beautiful creature had been awakened in him. If she would consent to marry him, he promised to pardon her brother, thus being ready to add one injustice to another. The idea was horrible to a young lady who had just given up the thought of marriage, and of all men Angelo would have been the last she could have cared for. So she indignantly refused him, and when she visited her brother in prison, he, too, approved of her refusal; but as he thought of his impending doom, his courage

failed him and he begged her to submit.

The talk between the brother and sister in the prison had been overheard by a monk, or friar, who was none other than the Duke in disguise, and he was filled with anger to find that Angelo was abusing his trust. In a flash he thought of a clever way to outwit Angelo and bring happiness where so much sorrow threatened.

There was a lady, he told Isabella, named Mariana, whom Angelo, five years before, had vowed to marry, but did not do so, as her marriage dower was not forthcoming; yet Mariana loved him still. Isabella was to make pretence of agreeing to Angelo's proposal for the sake of her brother, but she had to arrange with this Mariana that she would take Isabella's place at the wedding, wearing a veil, so that the bridegroom would not discover the ruse until it was too late. Mariana had also to say to Angelo when she appeared before him veiled: "Remember now my brother."

All this was carried out accordingly; but a pirate having died in prison, whose hair and beard resembled those of Claudio, the Duke managed to get the head of this dead man sent to Angelo with the intimation that it was the head of Claudio! Meanwhile, Claudio himself

had been, thanks to the Duke, taken out of danger.

Now was the moment for the Duke to complete the discomfiture of his unfaithful deputy; so, withdrawing from the city, and dressing again in his proper clothes, he sent forward news that he was returning from Poland. Angelo came to the city gate to meet him, and the usual friendly speeches were made, the Duke appearing ignorant of all that had happened. Then came forward Isabella, pretending to appeal to the Duke to punish Angelo for having murdered her brother. Angelo was indeed dismayed when the veiled lady he had but newly wedded also came forward and disclosed herself as his old sweet-heart.

The Duke threatened to visit upon Angelo the fate which the latter had designed for Claudio; but both Isabella and Mariana begged that he might be pardoned, and this the Duke agreed to. Nor did Isabella refuse the offer of the kind-hearted Duke to make her his own wife. And so the comedy ended, with happiness for all. We can see why it is called "Measure for Measure," since Angelo was made to feel himself in very much the same position as he had placed Claudio, and "Tit for Tat" would be a children's title for it.

THE COMEDY OF "A WINTER'S TALE"

THERE were two Kings who had been brought up together and grown to like each other so well that they were almost as brothers. The one was King of Sicilia, his name being Leontes; and the other, who was called Polixenes, reigned over the kingdom of Bohemia. Once when Polixenes was on a visit to Leontes, the latter had so enjoyed his society that he begged his friend to stay longer. But Polixenes seemed bent on returning to Bohemia, until Hermione, the tender and loving Queen of Leontes, joined her entreaties to those of her husband, when Polixenes yielded to her gentle persuasion and decided to prolong his visit.

Unhappily, Leontes, though in the main a good and kind King, must have been of a jealous nature, for although he had asked his wife to urge Polixenes to stay, when his friend did, for her asking, what he had not seemed ready to do for him, Leontes suddenly became

foolishly jealous of Polixenes. In his folly he told his servant Camillo that he believed Polixenes and Hermione had fallen in love, but Camillo knew this was not true. He humored the jealous King, however, by promising to poison Polixenes if what Leontes said was true. But what he did was to tell the King of Bohemia of the madness that had come upon his old friend, and that night both Polixenes and Camillo had fled from Sicilia.

Nothing would persuade Leontes of his folly, and he accused his poor Queen of acts and thoughts of which she was entirely innocent. He even refused to look upon their newly-born daughter, Perdita, and ordered that the child should be taken and left to die in a desert place.

Naturally, Hermione denied the unjust charges brought against her, and in this she was supported by the famous oracle at Delphi. This oracle was supposed to be the voice of the gods, which

THE COMEDY OF "A WINTER'S TALE"

in those pagan times could be consulted on matters of difficulty through the priestess in the great temple of Delphi. It was, of course, entirely superstition; but the answer that came from Delphi as to Hermione's conduct said she was entirely innocent, whereas Leontes was a jealous tyrant, who would not have an heir to his throne "if that which is lost be not found."

Soon the words of the oracle seemed to be coming true, as the King's only son, the young Prince Mamillus, died of grief at his mother's woes; and Hermione herself became so ill that it was said she, too, had died.

Too late, the jealous King realized his folly; and now that he believed both his wife and son to be dead, he declared he would visit their grave each day and spend his years in mourning.

But Leontes did not know that, while the officer who had taken the little Perdita to a desert part of Bohemia had himself been killed by a bear, the child had been rescued by a shepherd, who knew from certain jewels and other things the officer had with him that the child was of royal birth. Still, the shepherd took no steps to find out her parents, but brought her up as his own daughter, and watched her with joy and delight as she grew into the loveliest shepherdess that ever was.

Sixteen years had thus passed by, and Perdita found herself beloved by a brave and handsome youth, who often came to visit her as she tended her sheep; but whence he came she did not know.

After all these years, too, Camillo, who had lived with Polixenes since they fled from Sicilia together, had a great

longing to return to his native country. But the King of Bohemia was loth to let him go, as he wished that they should go together in disguise to discover why the young Prince Florizel was so often absent from Court and loved to spend his time in the country.

This Camillo agreed to, and their discovery was indeed a surprize to the King, as Florizel proved to be none other than the sweetheart of Perdita, the shepherdess, whom he wished to marry. The King, of course, sternly forbade him, and threatened to have Perdita removed if she ever saw Florizel again. But Camillo now carried out his wish to return to his native land, and took with him, in disguise, both Florizel and the lovely shepherdess.

Leontes gave a warm welcome to the son of his old friend, whom he had so greatly wronged; and the old shepherd, having followed the runaways into Sicilia, disclosed the parentage of Perdita, to the joy of her father.

Then came the happiest event of all, when Paulina, a dear friend of Hermione, and widow of the officer who had taken Perdita away, invited Leontes to see a beautiful new statue of Hermione. When he did see it, so lifelike it seemed that he could scarce forbear to touch it; and lo! the figure descended from the pedestal and laid her head upon his breast. It was Hermione alive, for she had never been dead!

Leontes, now happier than his former folly gave him any right to be, was friends again with Polixenes; and, of course, Florizel and Perdita were married in due course, thus uniting the fortunes of the two kingdoms.

MUCH ADO ABOUT NOTHING

WHEN he was returning from battle, with some of his principal followers, Don Pedro, Prince of Arragon, an ancient kingdom of Spain, broke his journey at the town of Messina to rest for a time as the guest of its governor, Leonato.

This Leonato had a daughter, as gentle and good as she was beautiful and clever. Her name was Hero, and she and her cousin Beatrice, who was witty and merry, more lively, but not quite so even-tempered as Hero, made the home of Leonato bright and happy. It so happened that in the train of Don Pedro there was a young and brave gentleman

of Florence, named Claudio, a great favorite of the Prince, because of the soldierly service he had rendered him.

Claudio was very happy in going to Messina, as he was in love with Hero, whom he had seen before, and he now rejoiced that the Prince had promised to advance him assuitor for that charming lady's hand.

There was another gentleman of the Prince's train, named Benedick, a young nobleman from Padua, who was also a favorite of Don Pedro's; and he, too, was brave and manly, but more moody than Claudio, sometimes liking to read a book rather than to make himself agree-

able to the ladies. All went smoothly so far as Hero and Claudio were concerned, for not only was it clear they loved one another, but, Leonato having given his consent to their marriage, preparations for that happy event were soon in progress. Meanwhile, every time that Beatrice and Benedick had met they found occasion to quarrel, and, though they seemed to like each other's company, one might have thought, to hear them, that nothing would ever induce either to marry.

Now, when a couple are engaged to be married they are usually so happy that they like to see others happy also; and so it was with Hero and Claudio. Together with the Duke and Leonato, they agreed upon a little plan to make Beatrice and Benedick cease their bickering and love each other.

One day, when Benedick had withdrawn to a shady arbor in the garden, the Prince, Leonato, and Claudio seated themselves near to where he was and began to talk, so that Benedick might hear them in his arbor, about the way in which poor Beatrice was dying of love for him! They pretended that she was deeply in love with Benedick, and yet Hero had said: "Beatrice would die ere she made her love known."

This, you will see, was the beginning of their little scheme, and it is no wonder that Benedick, overhearing their remarks, began to think his behavior to Beatrice had been cruel and ungallant.

Meanwhile, Hero had her part to play in this pretty comedy of love, and, sending one of her attendants to tell the unsuspecting Beatrice that Hero and another lady in the garden were talking about her, it was not many minutes before that lively and inquisitive lady had stolen out to overhear what they might have to say. Their talk was all about Benedick being deeply in love with her. They also spoke in so much praise of him that Beatrice forthwith became as tender in her thoughts towards him as his had now become towards her.

But into this happy comedy the figure of a mischief-maker now steps. This is Don John, half-brother of the Prince, whom he hates so much that he would do anything to annoy him. For the moment he can think of nothing better than to stir up the feeling of jealousy between the Prince's young friend

Claudio and the unsuspecting Hero. Assuring the lover that Hero had really given her heart to another gallant, and inducing both Claudio and Don Pedro to hide with him in the garden on the eve of Hero's intended wedding day, a lady was seen by them at Hero's window bidding farewell to an unknown man. This was merely one of Hero's lady companions saying good-night to her own sweetheart, a follower of Don John, but Claudio and the Prince were both misled into thinking it was Hero herself.

Claudio, mad with rage, swore to renounce the innocent Hero at the altar next day. This cruel threat he actually fulfilled, and the poor lady, utterly at a loss to understand the cause, almost died of grief. Her cousin Beatrice, of course, would not believe her capable of any dishonorable action, and made Benedick, now really in love with herself, undertake to fight a duel with Claudio.

In the meantime it was pretended that Hero had really died; and Benedick had challenged Claudio to the duel, just when Dogberry and Verges, two comically stupid officers of the watch, brought in two of Don John's followers whom they had arrested at night, scheming of some plot, as they believed. To save himself, one of the prisoners at once confessed that he had visited his sweetheart that night, so that when she came to the window the watchers in the garden might mistake her for Hero. This he had done at the instigation of Don John.

Claudio, on hearing this, was overwhelmed with grief, and, believing the innocent lady to have died, he was in despair; but Leonato told him his brother had a daughter the very image of the child he had lost, and if Claudio would marry her he would forgive him the sorrow he had caused by his folly in listening to slanderous tongues.

When this new bride came to meet her bridegroom, her features were masked; but judge of Claudio's surprise when she uncovered her face, and he looked again into the dear eyes of Hero!

The threatened duel between Claudio and Benedick had now no excuse, for all were friends again, and not only do we see Hero and Claudio ready for their wedding; but Beatrice and Benedick also.

Don John was imprisoned, and in due time was punished for mischief-making.

THE NEXT STORY OF FAMOUS BOOKS IS ON PAGE 637.

The Story of THE EARTH.

WHAT THIS STORY TELLS US

WE come in these pages to the story of what the earth is like to-day. We have learned how men arrived at the great fact that the earth is a moving ball going round the sun, and how we suppose the ball came into being. We have considered its shape and its size. Here we learn what men know about the stuff the ball is made of, and the way it is held together. We are born upon this great ball which is carrying us through space, and we cannot leave it. Though, compared with all the stars and suns and planets, the earth is only a grain of dust, yet it is to us the most important part of the whole universe, and we are right to think so. Therefore we cannot know too much about it. We read here of the earth's crust and its inside, and we begin to learn how the world is kept warm.

THE EARTH AS IT IS TO-DAY

SO far we have been going over a kind of history, showing very shortly the chief things that have happened in order to make the earth of to-day. But we have seen also what people are so apt to forget—that the things which went on in the past are going on still; *the earth, which is the product of changes, is still changing.*

We shall not talk here about the oceans and the seas and continents and mountains—what is called geography. That is important, and we shall come to it in its proper place and at the proper time. We must begin now by thinking of the earth as a ball, speaking about it just as one might speak about a cricket-ball. Perhaps you know that a cricket-ball has a certain weight, that it has a cover, and that inside this there is a core, which is made of certain materials put together in a particular way. You may also know that a cricket-ball is elastic, so that when you throw it against a wall it comes back again instead of spreading out and sticking to the wall, as a lump of mud would. Now, just in the same way I want to tell you about the great earth-ball, tiny little pieces of which we put together to make cricket-balls, cathedrals, and other things.

In the last part we said what the size of the earth was. Now, we have a good idea of what a yard is and what a mile is, but it is very difficult

CONTINUED FROM P. 433



to imagine such a distance as 25,000 miles; yet, though this sounds such a

big figure, I do want you to realize that, compared with other things, the earth is really very small. For instance,

there is a very good way of comparing the size of the earth with that of the sun, as shown in the picture on the next page. If the centre of the sun could be placed at the centre of the earth, the surface of the sun would reach far beyond the distance that the moon is from the earth—that is to say, the sun occupies far more space than the whole of the space swept by the earth and the moon moving round her.

And yet the sun does not look so very much bigger than the moon, though really you might throw a thousand moons into the sun, and the difference they would make would not be worth mentioning.

Now, I am not going to give you the figures which say how many square miles there are on the surface of the earth, or yet many millions of millions of tons it weighs, because we cannot realize what these figures mean, and so they are of no use to us at present.

There is, however, one enormously interesting thing about the earth which can be expressed in a way which we understand, and which is interesting, because it means so much, and this is the question of the density of the earth. First of all, I

THE STORY OF THE EARTH

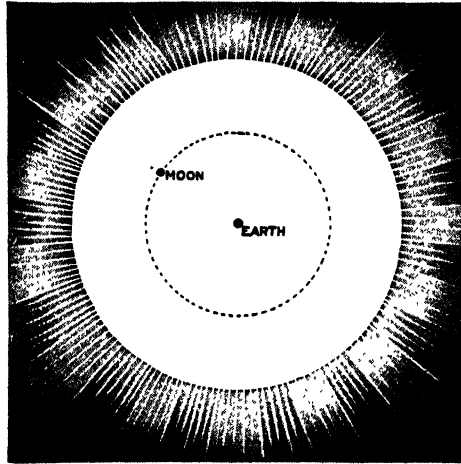
want to tell you what density is ; second, how the density of the earth can be found out ; and, third, what the earth's density is and what it means.

A tennis-ball is bigger than a golf-ball, but it is not so heavy. There is more stuff in the golf-ball than there is in the tennis-ball. A big piece of coal is heavier than a small piece of

coal. There is more stuff in the bigger piece ; but if you took two pieces of the same size they would be the same weight—that is to say, they would have the same amount of stuff in them. Now, there is a special word for the size of a thing—that is to say, for the amount of space that it occupies. This special name is volume, and really it is not difficult to understand, for it only means size, or bigness. Now, as the tennis-ball and the golf-ball show, the volume of a thing tells you nothing about its weight, or, rather, about the amount of stuff in it—*unless* you can compare it with a different volume of the same material, as in the case of pieces of coal of different size. So we want a special word to mean the amount of stuff there is in any particular kind of thing as compared with a similar volume, or size, or bigness, of something else. You know what a cube is—a thing like the bricks you used to use for making pictures. Now, if you can imagine a cube of

water, such as you might have by pouring water into a cubical vessel, that would have a certain amount of stuff in it according to the size of the cube. If, now, you poured the water out and filled the cube with mercury instead, you would have the same volume, or size, or bigness, of mercury, but it would be much heavier. The mercury gets more

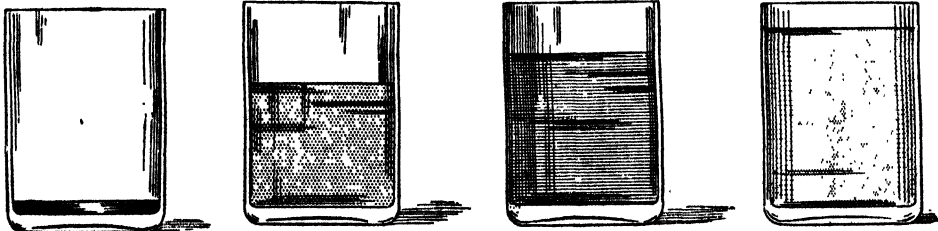
THE DISTANCE ACROSS THE SUN'S FACE



The sun is so much bigger than the earth that if the sun was placed at the centre of the earth the outer edge would reach as far beyond the moon as the moon is from the earth. It is four times as far across the sun's face as it is from the earth to the moon.

stuff into the same amount of space than the water does. Now, the proper way of saying this is that the mercury is *denser*—or has a greater *mass*—than the water. Perhaps you will say that you do not see any particular reason why it should not be good enough to say that the mercury is heavier than the water. The only objection to that is that, though it is quite true for here and now, yet the heaviness, or weight,

of a thing depends upon the earth's pull for it and its pull for the earth ; whereas the amount of stuff in it—which is what we are interested in—would remain the same even if the earth were moved a million miles away, and so could scarcely pull at all. Therefore, instead of describing the amount of stuff in a thing by the word "weight," we use the word *mass*, or *denseness* ; and the mass of a thing would remain the same, of course, even if it were moved to the moon, where it would



These pictures help us to understand what we mean by the density of the earth. Here are four glasses. The first contains a little mercury, or quicksilver ; the second is more than half full of glycerine ; the third contains a little more of water ; and the fourth is nearly full of kerosene. Though the space occupied by these is so different, each has the same amount of stuff, just as a piece of snow, when melted into water, has the same amount of "stuff" as before, though it takes up less space.

weigh far less, as the moon is smaller, and therefore pulls less hard, or if it were moved to Jupiter or the sun, where it would weigh much heavier, since these are much larger than the earth, and pull much more powerfully.

Now, in order to compare the massiveness of different things—which we usually call their *density*—we take a certain volume of water under definite conditions, and call its density *one*; then, if we find that something else is twice as massive, or dense, as water, we say that its density is *two*—and so on. I am sure you will understand that if the thing we were comparing with water were at the same distance from the centre of the earth, then, if it were twice as dense as the water, the same volume, or bigness, of it would be twice as heavy, or would weigh twice as much. But I have explained to you why we do not use the word weight, as weight depends upon the earth's pull—or the moon's pull if we were on the moon; and if you think that it is not worth while to make this distinction, I can very soon show you that it is.

WHY IT IS THAT THE SAME THING DOES NOT ALWAYS WEIGH THE SAME

If we take two metal cubes of exactly the same size and material, and place them side by side on a flat table, then, besides being of the same density, or massiveness, they are also, of course, of the same weight. But if, instead of having the two cubes side by side, you put one on top of the other, though they are still of the same massiveness, or density, though there is still the same amount of stuff in the one as in the other, yet it can be shown that the one which is above now weighs less than the other, because it is *a little bit further from the earth*, and therefore the earth and it do not pull each other quite so hard. Now, I hope you agree with me, after this, that there is some sense in distinguishing between mass and weight.

How are we to find out what is the density of the earth? How are we to find out whether this great ball is less massive, or dense, than water, or more massive, or dense? This is a problem which men of science have long been engaged upon, and it has been thought out in various ways. Just now, perhaps, it is enough to say that if we can measure the extent to which the earth makes

a pendulum swing, and the rate at which that pendulum swings, we can measure the force with which the earth acts upon it, and therefore, as we already know the size, or volume, or bigness, of the earth, we can say how dense it is—that is to say, how tightly the stuff in it is packed.

THE EARTH INSIDE IS PACKED MORE TIGHTLY THAN ANYTHING WE KNOW

Now, the extremely remarkable conclusion to which we come is that the earth is somewhere between four and six times as dense as water.

Water, you know, is a very heavy thing, and as long as we think about things at the surface of the earth, that is as good as to say that it is a very dense thing, because weight or heaviness is a perfect guide to density or massiveness, so long as we are comparing things at the same distance from the centre of the earth. Now, if the earth, as a whole, is five times as dense as water, the stuff in the inside of it must be squeezed together more tightly than we can imagine. None of the things we know and can examine at the surface of the earth, no rocks or coal, or anything of that sort, are nearly as dense as this average density of the earth, and therefore, away down beneath us, the stuff of which the earth is made must be so tightly packed that the densest things we know, such as lead, can be almost nothing compared with it.

THE THIN CRUST OF THE EARTH, UPON WHICH WE LIVE

This is not only very interesting in itself, but it is also very important, because of what it tells us as to the tremendous forces which are, so to speak, chained up underneath us.

Sometimes, as we know, these show themselves by means of earthquakes. It is also interesting to know that the crust of the earth, compared with the whole size of the earth, is really extremely thin. It feels firm enough under our feet, and there is no fear of its cracking and letting us through, but I think that if the earth could be cut right through the middle like an orange we should be very much astonished, if we could take a sort of birdseye view of the whole cut surface, to see how thin is the crust on which we walk and from which all living things have been produced. Of course, when we learn

that the inside of the earth has this extraordinary density, we are apt to think of it as solid—far more solid than lead. But another great fact about it is that it is intensely hot, so hot that no heat we know on the surface of the earth can compare with it. It is, indeed, probable that the inside of the earth is so hot that the stuff of which it is made is not really solid at all. On the other hand, we may be wrong in thinking of it as liquid or as a gas, for it is more than likely that matter inside the earth, owing to heat and pressure, has a state which is like nothing that we know.

IF WE COULD THROW THE EARTH AT A WALL IT WOULD BOUNCE!

We said something a little while ago about a cricket-ball being elastic, so that when it is thrown against a wall it comes back again, instead of spreading out and sticking there like a lump of wet mud. When we say that a thing is elastic, we simply mean that when it is put out of its shape it comes back to its old shape as soon as it can. When the cricket-ball hits the wall, it is flattened at one part for a twinkling of time, and then it springs back to its original shape, and that makes it bound back from the wall. Now, if you could throw the great ball called the earth against a wall, it would spring back more perfectly than a cricket-ball, more perfectly even than a ball of steel. Only I do not think this experiment will ever be made.

There is a cheap kind of cricket-ball which is called a composition cricket-ball, often called "compo" for short by boys. This means that it is a composition of a number of things put together.

THE DIFFERENT MATERIALS OF WHICH THE EARTH-BALL IS MADE

Well, the earth is also a "compo," composed of a large number of different materials put together in a particular way; and this question of the composition of the earth is an immensely interesting one, which we must study carefully. But before we go into that I want to tell you about the very newest thing that we have just learnt about the composition of the earth; and I want to tell you this first, though it is the thing we have learnt last, because it tells us far more than ever we knew before about the history of the earth,

about what is happening to it now, and about the wonderful way in which the earth is kept warm. This is a perfectly wonderful discovery. The special kind of stuff with which it deals is very rare, but it is one of the substances which make up the earth. There is so little of it that if the stuff were not so wonderful in itself it would not be worth mentioning. Its name is radium; but before I tell you why its discovery in the earth is so important, we will ask ourselves in what ways the earth might be kept warm.

In the first place, the earth might be kept warm by the heat of the sun—of which we catch only a very tiny amount, of course, but still enough to produce all the life on the earth, our own included. However, during the night the earth throws back into space the heat which it got from the sun during the day, and as you know what night and day mean, this is as much as to say that all the time one half of the earth is getting heat from the sun the other half is losing it. We are quite certain that the earth would soon freeze solid, and become as dead and cold as the moon, if the sun's heat were all it had to keep it warm. The moon gets the sun's heat just as we do, but the moon is cold.

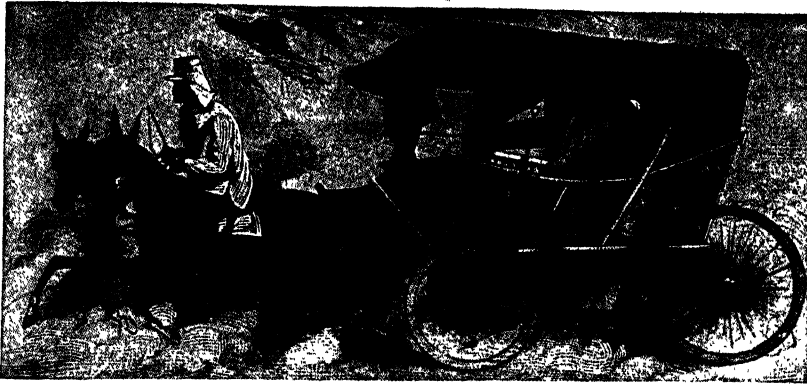
YEAR IN, YEAR OUT, THE EARTH IS ALWAYS LOSING ITS HEAT

Secondly, we know that the earth is kept warm by the heat in its inside. It is not making any heat in its inside, however—or so, at least, we thought until the other day—but the heat from the inside simply soaks outwards and keeps the crust warm, and then it passes away from the crust into the air, and is finally lost.

Year in, year out, then, the earth is slowly losing its heat, and, of course, this could not go on for ever. The moon, of course, was hot when it began, but it has got cool much quicker than the earth, because it is so very much smaller. A small thing always loses its heat quicker than a big thing, because a small thing has a bigger amount of surface to lose its heat by in proportion to the amount of stuff in it. That is why a baby has to be kept so very warmly clad.

THE NEXT PART OF THE STORY OF THE EARTH BEGINS ON PAGE 645.

The Book of GOLDEN DEEDS



FLORENCE NIGHTINGALE TRAVELING ON THE BATTLEFIELD

THE LADY WITH THE LAMP

EARLY in the last century there was a pretty little girl living in a beautiful English home, surrounded by a handsome park, who played with her dolls in quite a new and startling fashion. She was fond of cuddling these little creatures, and she undressed them and put them to bed, and made tea for them in dolls' house china, just like all other little girls in every age of history. But she did something else as well. She used to pretend that they were ill, and nurse them; and also she used to pretend that frightful accidents had happened to them, and would bandage their legs and arms with strips of linen, and treat them with great care.

As she grew older she used to go into the cottages of the peasants round her father's estate, and if she found any of them ill she would set about nursing them and trying to make them well. It was wonderful to see this bright girl, who might have spent all her time in games and sports, giving herself with delight to nursing the sick people in her village. She was intensely fond of animals, and the first patient she had was a dog.

Well, the years passed away, and this happy child, whose name was Florence Nightingale, became a hand-

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some young lady, who had to go to London with her parents to be presented at Court. But she did not like the easy and pleasant occupations of society, and instead of going out to parties she visited the London hospitals and studied how sick people were nursed back to health and strength. In those days hospital nurses were very ignorant, and Florence Nightingale was shocked by the roughness and stupidity of England's hospitals. So she went away to Germany and studied nursing there; and then she went to Paris and learned all she could there. At last, when she was quite certain she had mastered her subject, she returned to England and began her work of improving the nursing in the hospitals.

While she was engaged at this work a war broke out in the Crimea between Russia and England. At first people thought only of the glory of battle, and the courage of soldiers who went singing to death. But soon other stories came home to England, dreadful stories—stories of wounded men being left to die, and of other wounded men being operated on by surgeons in the blood-soaked trenches. England was shocked by these things, and everybody cried out that something

THE BOOK OF GOLDEN DEEDS

must be done, something heroic, something that would put a stop at once to the sufferings of the brave soldiers. That was done by Florence Nightingale.

The little girl who had nursed the sheep-dog and bandaged her dolls now stood forth as England's Angel of Pity, and as long as England's history is written the name of Florence Nightingale will shine in golden letters on the page. She went to the Crimea with less than forty nurses, and in a few months she had made an absolute change in the nursing of the soldiers. Can you not imagine the peace that came to the poor wounded soldiers when they found themselves tended by gentle women, laid in smooth

tell you that at the time of her coming forty-two men died in every hundred of the wounded, while soon after her arrival only two died in every hundred. She had as many as 10,000 wounded soldiers to care for, and when they had to be carried into the operating-room—and you must remember that in those days there was no such thing as chloroform—Florence Nightingale would go with them, stay by their side and cheer them to bear their sufferings.

England heard of all this splendid work, and the name of Florence Nightingale became a household word in the land. A subscription was made for her, and £50,000 was raised as a gift. A man-of-war was sent to bring her home,



MISS FLORENCE NIGHTINGALE AND HER NURSES COMFORTING SICK SOLDIERS

and comfortable beds, and felt tender hands which shrank from causing the smallest pain lovingly bandaging their throbbing wounds? Florence Nightingale was always in the wards, and at night she would go slowly between the beds, carrying a lamp in her hand, to see that her patients lacked nothing. The soldiers, looking through the darkness at the figure moving like an angel among them, called her "The Lady with the Lamp." Her name, it was found, contained letters enough to make the sentence "Flit on, cheering angel." That is what she was to those thousands of tortured soldiers in the Crimea—a cheering angel.

You will understand what wonderful work this noble woman did when we

and preparations were made for a glorious triumphal entry into London. But Florence Nightingale did not want fame. She went home secretly, and went quietly back to her father's house. And as for the £50,000, she thanked England for the gift, and used it all to found a home for the training of nurses. Though her health was broken by the hardships that she had undergone, she lived for many years, and to the day of her death in 1910 there was nothing dearer to her than the work to which she gave herself as a little girl. She never asked for fame or glory; all she wanted was to do good, and to lessen pain and alleviate suffering was her greatest joy. To-day, thousands of women are following in her footsteps.

THE NEXT GOLDEN DEEDS ARE ON PAGE 633.

The Book of OUR OWN LIFE

WHAT THIS STORY TELLS US

WE know that life came out of the sea, and that its real progress began when it swam ashore, where life found the oxygen, of which it could not get enough in the sea. Without this oxygen life can have no warmth. If the oxygen in the air could be withdrawn, the warmth that stirs our blood would go with it—our blood would cool and we should die. All men and women, all land animals, have warm blood, which fishes have not. Fishes, therefore, cannot advance in life: they can never have life at its best and highest, because life is at its best only when it is warm. Yet, though life left the sea to get warm, it can keep warm only in water. That is one of the great wonders of life, and it is true that every living thing, a mouse in its hole, a lion in the forest, a lark in the air, a boy or girl at school, must have water in their bodies every moment, or die. So that, though life came out of the sea to get warm, it brought from the sea the very means of keeping itself alive.

WHY LIFE NEEDS THE LAND

WE have seen what happened to water-breathing life, and now we have to study air-breathing life. The first important thing is to make sure what the difference between the two kinds of life really means. What will be the result if a creature, instead of being able to use up a certain quantity of oxygen in every minute of its life, is able to use up, perhaps, ten times as much? All life, we must remember, is, in one way, a process of burning—of mixing certain materials with oxygen, just as we make coal mix with oxygen in a fire every day.

Now, so long as life could get only the very small amount of oxygen that is in water, it had nothing to spare for any kind of extravagance—that is a long word, but I think most of us will soon learn what it means. Its income, or pocket-money of oxygen, so to speak, was very small, and all of it had to go in necessities. Certainly, there was nothing to spare for keeping it warm.

Of course, you understand that when I say this I am only making a comparison. But if you will think of a fish—a poor, dying fish, which you may pick up in your hand—and will compare it with your hand itself, you will see at once what I mean. One of the great differences between the fish and you is that the fish is cold and you are warm. We usually call the

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fish a cold-blooded animal, and contrast it with warm-blooded animals. Birds are the warmest blooded of all animals.

Now, the reason why life in the sea is cold-blooded is that these kinds of life use up only a very small amount of oxygen. There is so little oxygen to be had that the fish cannot use any of it for the purpose of keeping itself warm. And so the fish, like other cold-blooded animals, behaves, so far as its warmth is concerned, just like a piece of stone, or anything else that is not alive at all. If you have a number of different things in a room, and leave them there for some time, each of them will soon be just as hot as the others; if now you bring a tumbler of hot water into the room, it will get cold, and the other things in the room will get a little bit warmer, though you cannot notice it. The rule is simply that the amount of heat, or warmth, in any place spreads itself about over everything, so that no one thing is hotter or colder than any other. Now, this is what a cold-blooded animal, such as a fish, does. It is just as hot as its surroundings. If it is in very cold water, the fish is very cold; and if it swims into warm water, then it becomes warm too, but not warmer than the water.

Now, this is very serious for the fish, and for all cold-blooded animals.

It is a serious matter for any living creature to be hot at one time and cold at another, and, indeed, to be almost always getting either hotter or colder, according to whether it is colder or hotter than its surroundings. It is always having to make new arrangements, and can never count on having things fixed. This, I believe, is the real reason, or, at any rate, one of the most important reasons, why no cold-blooded animal—no life in the water—can ever do such wonderful things as life on land. We shall soon see the other most important reason for this.

HOW LIFE LIGHTS A FIRE TO KEEP ITSELF WARM

For now let us contrast with the fishes the case of warm-blooded animals. The fish in your hand is cold, and your hand is warm; your whole body is warm, and that is why other things—unless they have been specially made hot—feel cold to your hand. The truth is that air-breathing animals can help themselves to as much oxygen as they please, so to speak, and after they have taken all they need for necessities—which is all that the fish can ever get—they can help themselves to more for luxuries. And what they do with it is simply to light a fire within themselves—you know I do not mean the sort of fire that you have in the furnace—and so they keep themselves warm. The warm-blooded animal is hotter than its surroundings, because it is making quantities of heat inside itself with the help of the large supplies of oxygen it can get from the air.

Now, what is the good of this? Why is it that the warm-blooded animals are so much cleverer and more wonderful than the cold-blooded animals which we find in the sea, or than the humble cold-blooded animals which we find on the land, such as the frog? We shall not understand this until we ask ourselves what it means to be a warm-blooded animal.

THE FIRE WITHIN ALL LIVING THINGS IS KEPT STEADILY BURNING

It does not mean that the animal just makes itself as hot as it pleases—one day very hot, and another day not so hot. The great fact about the warm-blooded animals is that they are just as hot one day as the next, and as the day before.

Very likely you have had your temperature taken with a thermometer when you were ill. Now, that is done because the doctor wants to find out whether you are too hot or too cold, or just as hot as you ought to be; for he knows, and everybody knows, that there is just a certain level of heat at which all healthy people must be all the time. The heat of the blood of a warm-blooded animal is a fixed thing—from minute to minute, from hour to hour, from hot day to cold night—it never varies, except to such a tiny extent that you can scarcely find it out. It is the same on the coldest day in winter and the hottest day in summer; it is the same whether you go as near the North Pole as you can, or to Panama, where the sun blazes. As long as you are well, your warmth is strictly fixed all the time.

Now, this is true not only of men and women and children, but also of all warm-blooded animals. The changes in their warmth, or temperature, as we say, are of the very tiniest kind, and when they *do* happen, last for only a very short time. It was only a few years ago that any instruments were made clever enough to show these differences in temperature, so small are they.

THE FIRE BURNS ALL THE TIME AT THE SAME HEAT

What is true of us is true of the dog and the cow and the sheep and the birds and all warm-blooded animals. The warmth, or temperature, of the fish goes up and down, down and up, according to whether the sun is shining on the water, or cold streams of water are coming in, and according to a thousand other things. A thousand things play also upon the warm-blooded animal, but it keeps its fire burning within it, so that, whatever happens, it is no hotter and no colder than it was before.

But it is not merely that the warmth of the warm-blooded animals—that is to say, of all the important life on land—is fixed. The other great fact is to be found in the point at which it is fixed. We might expect, perhaps, that a little bird would have a certain amount of temperature, and an elephant something quite different, and a man something different again. But when we come to compare the temperature of all the warm-blooded animals we find that it is just about the

same for every one of them. The birds are generally a very little hotter than other animals, but the difference is very small indeed. It is fair to say that all warm-blooded animals live at about the same point of warmth. Now, what do you think this must mean?

It means, we may be quite sure, that *there is a particular hotness, or temperature, at which life goes on best*, and since life is everywhere the same thing, whether we find it in a sparrow or an elephant, that particular point of warmth is about the same for both. When this heat is reached and kept, all the changes that go on in living matter do so with the greatest ease and success. So long as life lived in the water, which holds only a very little oxygen, it could never hope to reach this point of warmth at which it lives best. One or two fishes have been found which are always, it seems, a little hotter than the water around them, but only a very little.

It was not until the great step was taken to the land, and until living things learnt how to breathe air instead of water, and how to make the most of all the oxygen in the air—it was not until then that living creatures could keep themselves warm enough all the time to do the very best that is possible for them.

A NIMALS ON THE LAND THAT HAVE NOT LEARNED HOW TO USE THE OXYGEN

There are cold-blooded animals on land, but they are very humble and lowly creatures, and they suffer from just the same difficulties as the fishes, getting hotter and colder, one or the other, almost all the time. These cold-blooded animals have not learnt how to make the best use of the oxygen of the air. They have not lit a fire within themselves to keep themselves warm, and so they cannot do so much work, or such good work, as the higher or warm-blooded animals.

We cannot say much more at this time about the great world of plants, except to notice only one very important fact about plants, which is that without them animals cannot live. But it is interesting to remember that, though the plant-world also has covered the land as well as the bottom of the sea, it has not taken any advantage of the large supplies of oxygen in the air. It

only breathes very slowly indeed, and though some plants, like some fishes, are sometimes found to be rather hotter than their surroundings, they are never very much hotter, and they never come anywhere near the point of heat which we find in all the warm-blooded animals. When life reached the land, it had done all there was to do, so far as the place it lives in was concerned—simply because it had reached the place where the most oxygen is to be found. There are other very great advantages of living on land, but this is the real one.

L IFE'S STEP INTO THE AIR IS NOT OF GREAT IMPORTANCE

You might think, perhaps, that yet another great step was taken when life left the land for the air, as in the case of the birds; but this is not really a step of any great importance. Animals that do not fly live just as much in the air as the birds do. It is true that birds spend much of their time actually in the air, and can swim about in the great ocean of air, while we can only crawl about at the bottom, unless we trust ourselves to a balloon or a flying-machine; but, of course, the bird really lives on land just as much as we do. It does not sleep in the air, and it does not make its nest in the air. The real beauty of the bird's life is that, though its home, like ours, is on the land, it can soar about in the air when it pleases.

So really there is only one great step, so far as mere place is concerned, in the story of life, and that is the step from the water to the land. The bird is really a land animal, and though it can soar, it never really roams from its home on mother earth.

M ILLIONS OF LIVING THINGS ON LAND NO BETTER THAN THE FISHES

Now, we have spent some time in seeing why it is that the step from the water to the land was so very important. We must not forget, however, that there are hosts of living creatures on the land which are not warm-blooded, and which are really no higher and better, and are often, indeed, much lower, than the creatures which live in the sea. In the first place, we have seen there are all the land plants; in the second place, there are not only many animals which, as we shall see afterwards, are really higher than the fishes—frogs, lizards, serpents

—but there are also millions and millions of insects which, though they live in the air, are really much humbler animals than the fishes. These last are, of course, cold-blooded; and, indeed, it is not quite right to speak of their having any blood at all, for their blood is not like ours.

In the world as we know it to-day, life is to be found wherever life can be, and as much life as the amount of air, and food, and water make possible. Wherever life can exist at all, there we find just so much life as there is room for, whether in the sea or on land. But though already the earth is filled with life, this is by no means to say that it is filled with the best and highest life; on the contrary, the greater part of the life on earth, compared with the highest life, is humble and far from beautiful, but, as time goes on, the great fact is that these low and humble forms of life are giving place to higher forms. This, perhaps, may not be true of the sea, but it is certainly true of the land.

THE ONLY KIND OF LIFE THAT IS ALWAYS GOING FORWARD

There is only one form of life on the earth that steadily and certainly and naturally increases, and that is human life. All the other kinds stand where they were. Accident may cause one kind to increase for a time, then another accident will cause it to decrease. But from age to age there goes on the steady increase of man, as it has been going on for thousands and thousands of years in the past. There are more men, women, and children in the world when I write these words to-day than there were yesterday; and there will be many, many more when you read these words than when I wrote them. This wonderful fact never stops; it never has stopped since man first appeared on the earth, and we cannot say when it will stop; though plainly it must stop some day. Meanwhile, though everyone knows it in a kind of way, it is one of the biggest facts in our lives, in the story of the earth and in its future, and they are very stupid people who allow themselves to forget it. As we go on increasing we take the place of low and humble forms of life, and, indeed, we make all other forms of life serve ours, including even the life of the sea.

Now, if we compare this chapter with the last, we shall see that all the great part of the history of life is to be found on the land, or, rather, it is that part of the history of life which is lived in air and not in water. But though we shall not have very much more to say about the life in the waters, we must never forget what we said at the beginning—that life is something which always happens in liquid, or wet, water, and never anywhere else.

WHAT THE LARK TAKES WITH HIM UP INTO THE SKY

This is true not only of animals or plants that live in water, but also of those that live in air; and it is as true of the lark soaring in the sky as it is of a flat fish lying at the bottom of the sea. When the lark goes up in the sky he takes with him all the liquid water in his body, and it is really in that liquid water that his life is lived. Take it away, and the lark must die; and this is true of every living thing.

So we must remember that even though the first stages in the story of life, which were lived in the water, and also the life in the water now, are quite unimportant compared with the life which is lived in air, yet, in order that there shall be any life in air or on the land, liquid water must be carried wherever the living thing is to be. A clever Frenchman has quite lately made a study of the water in the bodies of animals, and he has shown that this water has in it a quantity of different kinds of what are called salts, the most important being the ordinary salt of the dinner-table. These salts are the same as are found in sea-water, and occur in just about the same amounts.

WE MUST NEVER FORGET THAT LIFE CAN LIVE ONLY IN WATER

I think that it is a most wonderful thing to have found this out, for it teaches us that, whatever life may do on land, it is yet something which is lived in what is very much like sea-water; and even when most of the sea is dried up, and the earth becomes smooth with land, like our wonderful neighbour in the sky, called Mars, I do not doubt that life will still be lived in that common but wonderful thing which we call water.

THE NEXT PART OF THIS IS ON PAGE 671



RUM-PEL-STILT-SKIN

IN a certain kingdom once lived a poor miller who had a very beautiful daughter. She was, moreover, exceedingly shrewd and clever; and the miller was so vain and proud of her that one day he told the King of the land that his daughter could spin gold out of straw. Now, this King was very fond of money, and when he heard the miller's boast he ordered the girl to be brought before him. Then he led her to a chamber where there was a great quantity of straw, gave her a spinning-wheel, and said, "All this must be spun into gold before morning, as you value your life."

It was in vain that the poor maiden declared she could do no such thing: the chamber was locked, and she remained alone.

She sat down in one corner of the room and began to cry, when the door opened, and a droll-looking little man hobbled in, and said, "Good-day to you. What are you weeping for?"

"Alas!" answered she, "I must spin this straw into gold, and I know not how."

"What will you give me," said the little man, "to do it for you?"

"My necklace," replied the maiden.

He took her at her word, and set himself down to the wheel. Round about it went merrily, and presently the gold was all spun.

When the King came and saw this he was greatly astonished and pleased;

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but his heart grew still more greedy, and he shut up the poor miller's daughter again with a fresh task. Then she knew not what to do, and sat down once more to weep; but the little man presently opened the door, and said, "What will you give me to do your task?"

"The ring on my finger," she replied. So her little friend took the ring, and began to work at the wheel, till by the morning all was finished again.

The King was vastly delighted to see all this glittering treasure; but still he was not satisfied, and took the miller's daughter into a yet larger room, and said, "All this must be spun to-night; and if you succeed you shall be my Queen."

As soon as she was alone the dwarf came in, and said, "What will you give me to spin gold this third time?"

"I have nothing left," said she.

"Then promise me," said the little man, "your first little child when you are Queen."

"That may never be," thought the miller's daughter; and as she knew no other way to get her task done, she promised him what he asked, and he spun once more the whole heap of gold. The King came in the morning, and, finding all he wanted, married her.

At the birth of her first little child the Queen rejoiced very much, and forgot the little man and her promise; but one day he came into her chamber and

reminded her of it. Then she offered him all the treasures of the kingdom in exchange; but in vain, till at last her tears softened him, and he said, "If in three days you can tell me my name you shall keep your child."

Now, the Queen lay awake all night, thinking of all the odd names that she had ever heard, and despatched messengers all over the land to inquire after new ones. The next day the little man came, and she began with Timothy, Benjamin, Jeremiah, and all the names she could remember, but to all of them he said, "That's not my name."

The second day she began with all the comical names she could hear of, Bandy-legs, Hunchback, Crookshanks, and so on; but the little gentleman still said to every one, "That's not my name."

The third day came back one of the messengers, and said, "Yesterday, as I was climbing a high hill among the trees of the forest where the fox and the

hare bid each other good-night, I saw a little hut, and before the hut burnt a fire, and round about the fire danced a funny little man upon one leg, singing:

Merrily the feast I'll make,
To-day I'll brew, to-morrow bake;
Merrily I'll dance and sing,
For next day will a stranger bring;
Little does my lady dream
Rum-Pel-Stilt-Skin is my name!"

Then the Queen jumped for joy; and as soon as her little visitor came she said:

"Is your name John?"

"No!"

"Is it Tom?"

"No!"

"Is it Rum-Pel-Stilt-Skin?"

"Some witch told you that!" cried the little man, and dashed his right foot in a rage so deep into the floor that he was forced to lay hold of it with both hands to pull it out. Then he made the best of his way off, while everybody laughed at him for having had all his trouble for nothing.

THE GEESE WHO KEPT GUARD OF ROME

ROME was besieged. An army of tall, fierce warriors, with blue eyes and golden hair, from the land of Gaul, had swooped down upon her, and forced their way within the gates of the great city itself.

Fierce battles were fought in the city, and the legions of Rome found themselves driven back again and again. The Gauls were not only strong—they were fearless. They rushed on the Romans with terrible shouts, and tore their ranks in sunder.

At last the poor Romans were forced to retire to their last fortress, called the Capitol. They were safe here, for who would dream of climbing up the steep rock to force the mighty walls of the Capitol? But sad and dreadful was it for the Roman soldiers, though they were safe, to look over the walls of their fortress and watch the savage Gauls burning their homes and carrying off all their precious things as booty.

The Romans began to be dreadfully hungry. Many a time they must have looked at the sacred geese which lived in the Temple of Juno, and thought it would be no crime to kill and eat them. But the geese were sacred birds to the Romans. To kill them would be sacrilege.

Now, it chanced one night, as a brave

young Roman named Manlius lay sleeping beside his sword near the Temple of Juno, that a strange sound striking across his troubled dreams woke him suddenly out of slumber, and made him grasp his sword and spring to his feet.

He recognized the noise at once. It was the hissing of the sacred geese. What could have roused those birds?

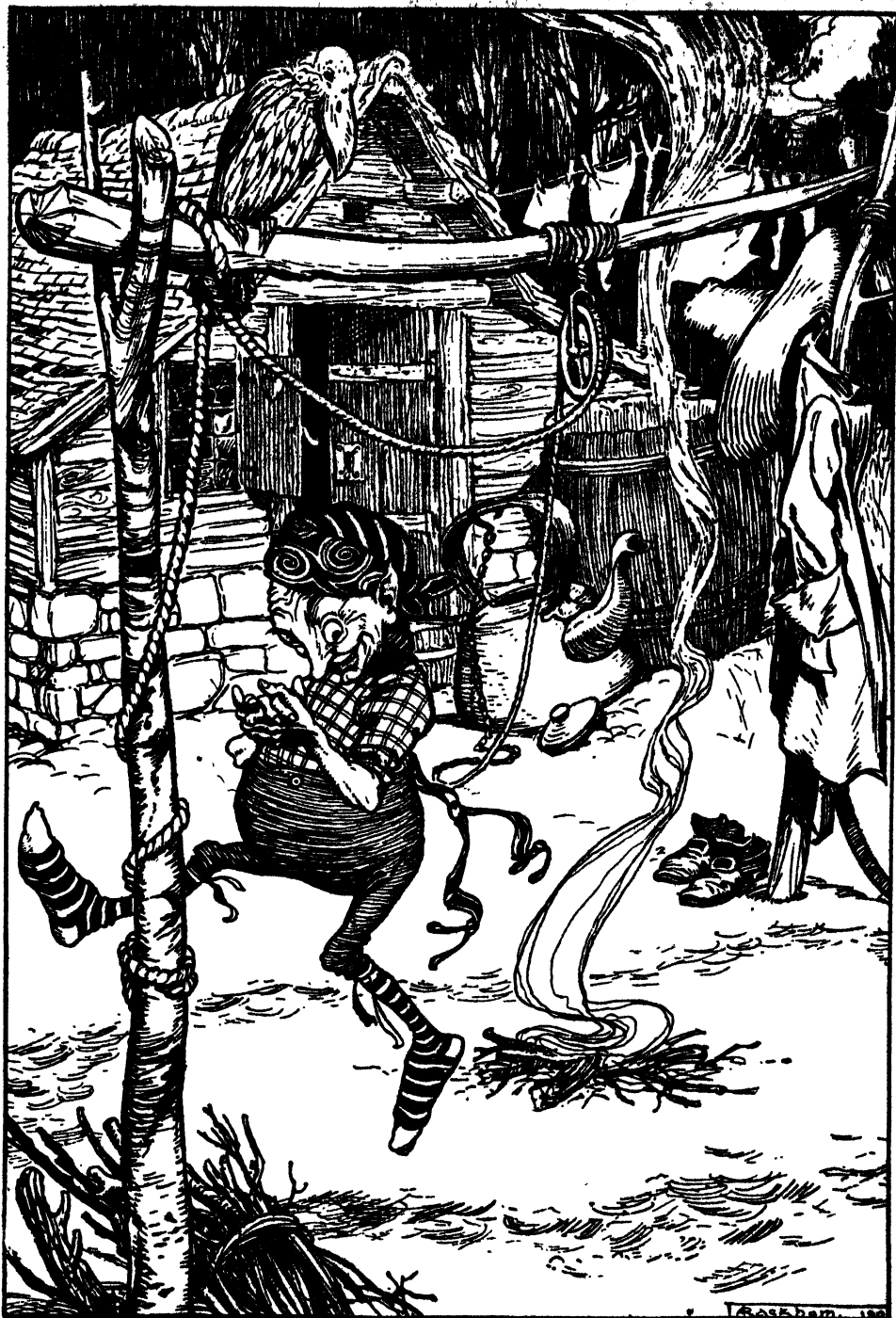
The noise increased; it became a panic of alarm; the whole flock was filling the night with its frightened cry.

Manlius ran to the walls of the fortress and looked down. He came face to face with a Gaul!

The leader of the Gauls had led his men up the pinnacle in a night attack, and he was just about to pull himself over the wall when Manlius appeared. In an instant Manlius seized the straining wrists of the Gaul, and, wrenching the fingers free of the parapet, hurled the enemy down the hill.

Louder and louder grew the night clamour of the geese. Romans started from their sleep, and, snatching their arms, hurried to see what it could be. They found Manlius defending the walls. With a shout of victory they rushed to his rescue, and in a few minutes all the garrison was roused, and the Gauls were beaten back and utterly routed.

THE DROLL LITTLE MAN WITH THE UNKNOWN NAME



When the Queen was rejoicing over the birth of her baby, the little old man who had helped her to spin the gold came and threatened to take away her son unless she found out his name within three days. She thought of all the names she could, and she sent messengers all over the country to find out other ones. On the third day came good news. "Yesterday," said the Queen's messenger, "as I was climbing a high hill among the trees of the forest, I saw a little hut, and before the hut burnt a fire, and round about the fire danced a funny little man upon one leg, singing, 'Rum-Pel-Stilt-Skin is my name.'"

THE MAGIC BOY FIDDLER OF SICILY

PERO was a merry, simple lad, and he lived in a village in the beautiful island of Sicily. His parents died when he was young, and at the age of fourteen he set out to make his fortune. He wandered about the country, and at last a miserly old farmer engaged him as a goatherd. But Pero forgot to arrange about wages, and when, at the end of the three years, he asked his master to pay him, the miserly old farmer gave him only threepence. But Pero went away as light-hearted as

"Well," said Pero, "give me, please, a violin that will make everybody dance, and a gun that will never miss, and the gift of speech, that nobody can refuse me anything."

The Spirit granted Pero these wishes, and Pero turned back to the farm. Seeing a pheasant fly by, he fired at it to test his magic gun. The bird fell, but before he could pick it up the farmer ran out and seized it.

"Well," said Pero, "you can have it if you like to dance for it."



Pero, with his magic fiddle, was travelling in Sicily, and fell among enemies, who resolved to hang him. But just as Pero was going to be hanged he played on the magic violin that made everybody dance, and the magistrate and the hangman and all the spectators danced to his playing. He played till they were weary, and the magistrate promised at last that if Pero would stop playing he should go free.

ever. On the road he met a beggarman, who said:

"My son, I am starving. Give me something to buy some bread."

"You can take my wages," said Pero, "and I will go back and serve three years more."

"You are really as kind as you are simple," said the beggarman, and as he spoke he changed into a bright spirit. "I give you three wishes. Ask and you shall have."

He played on his violin, and the farmer capered like a madman.

"Stop, Pero!" he cried at last. "I treated you badly, I know; but stop, and I'll give you a thousand crowns."

Pero received the money, but as soon as his back was turned the farmer ran to the magistrate and denounced him as a robber. There was little mercy for robbers in Sicily in those days. Pero was quickly arrested, tried, and con-

demned. But just as the hangman was putting the rope round his neck he asked the magistrate to let him play one tune on his violin.

"Don't give him the violin!" cried the farmer.

But Pero had the gift of speech, and nobody could refuse him anything. The magistrate gave the violin to him, and Pero played on it, and the magistrate and the farmer and the hangman and the spectators danced to his playing.

He played till they were weary; he played till they were worn out; he played till the soles came off their boots, and still he played. And the magistrate at last promised that if he would stop he should go free. Pero then came down from the scaffold, and took his gun and his violin and his thousand crowns, and returned to his native village, and, having the gift of speech, he won the prettiest girl in Sicily as his wife, and settled down contentedly.

THREE NIGHTS IN THE ENCHANTED CASTLE

ONE summer there was a great drought in Spain, and when autumn came there was no harvest. Many peasants wandered about the country in search of work and food, and among them was a good-looking, brave lad whose name was Juan Lopez. His mother and father were dead, and his master was ruined, and he had nowhere to go to.

One evening Juan came, hungry and homeless, to the town of Granada, and, finding no other lodging, he settled down to sleep amid the green ruins of an ancient Moorish castle. But just as he closed his eyes he felt a tap on his shoulder. Looking up, he saw a hand holding a lighted candle. It beckoned to him, and as Juan was desperate with hunger he followed.

The hand led him into a gorgeous hall where a table stood loaded with exquisite delicacies, and there Juan feasted to his heart's content. The hand then beckoned again, and led Juan into another splendid chamber with a bed in it. Juan took off his ragged clothes, and put on a silken nightdress which he found lying on a heap of rich garments, and got into the bed, and went asleep.

When the bells of Granada struck twelve, the hand came and awoke him, and a sweet voice said:

"It was very brave of you, Juan, to follow my hand. You are the first who ever dared to do so. Now, will you show yourself braver still, and set an unhappy, helpless maiden free from a wicked spell?"

"What must I do?" said Juan.

"You must stay in this bed for three nights and days," said the voice, "and

you must not move or cry out, no matter what is done to you."

"Very well," said Juan, "I will see if I can stand it."

On the first night a troop of spirits came with bludgeons, and beat poor Juan until there was not a sound bone in his body. But in the morning the hand appeared, and brought him refreshment, together with a magic salve which cured him of his hurt.

On the second night the spirits wounded him again, but he neither moved nor cried out; and the next morning the hand brought him a magic medicine which healed him. The ordeal of the third night was fearful, and no hand appeared at the break of day. But there came instead a princely maiden, who bathed Juan with a magic water that made him hale and whole again.

Juan then put on the rich garments, and went into the hall where the table stood, and feasted with the maiden. She was wonderfully lovely, and her loveliness was of a kind which Juan had never seen before. Her skin was of a creamy tint, with a deep rosy color showing beneath the cream; her little mouth was like a scarlet flower; and her dark eyes were large and liquid and tender, like the eyes of a beautiful fawn.

"Surely you are not a Spanish lady?" said Juan.

"No," said the maiden. "I am the daughter of the Sultan of Morocco. And now that the spell is removed I must return at once to my father's palace. Follow and find me."

She vanished, and Juan found himself sitting, ragged and poor, amid the green ruins of the castle.

He bravely set out to follow the

Princess, but as he had no money to pay his way it was a very long time before he reached her palace. The Princess thought he was faithless, and she arranged to marry the King of Arabia; but as she was getting into the wedding coach she saw Juan standing, poor, ragged, and sorrowful, by the palace gate.

"Some time ago," she said to the King of Arabia, "I lost the key of my jewel-case, so I got a new one. Now I have found the old key; which shall I use?"

THE FABLES OF ÆSOP THE SLAVE

THE FOWL AND THE JEWEL

A fowl searching for food found a precious stone.

"A great many people would be pleased to have this," he said; "but if I had all the jewels in the world I would willingly give them for one small barley-corn."



He could eat the barley-corn, you see, but the jewel, of course, was useless to him.

The best thing in the world is worth nothing to you if you have no use for it.

THE WOLF AND THE CRANE

A wolf, when eating his dinner one day, swallowed a bone, which stuck in his throat. He went about howling, asking every animal he met to help him, and promised a large reward to anyone who could get the bone out. At last a crane, who had a long, slender neck and bill, undertook the task.

Poking his long neck down the wolf's throat, he got hold of the bone and pulled it out; but when he asked for the reward the wolf laughed and said, "You may think yourself lucky that I did not bite your head off when it was in my mouth."

Some people are like this wolf. They are not grateful when anyone does them a kindness.

"You should use the old key," said the King of Arabia.

"Here is the old key I meant," said the Princess, taking Juan by the hand. "It was this brave, handsome boy who rescued me from the enchanted palace. So I will marry him, and you, O King, must find another bride."

And marry Juan she did. The King of Arabia, who was really a generous man, gave the happy bride and bridegroom a magnificent wedding present, and they lived happily together.

THE DOG AND THE SHADOW

A dog was once walking along a plank over a stream, carrying a piece of meat in his mouth. Looking down, he saw his own shadow reflected in the clear water. Thinking it was another dog carrying another piece of meat, he was so greedy that he snatched at it. This caused him to open his mouth, and the meat fell out and sank to the bottom of the stream.

People who try to get what belongs to others often lose more than they gain.



THE FOX AND THE GRAPES

A hungry fox happened to come one day into a vineyard where there were plenty of fine ripe grapes. Unfortunately for him, these grapes were growing on a trellis so high up that, though he leaped his utmost, he was not able to reach them.

"Oh, well, never mind!" said the fox. "Anyone can have them for all I care. They are sure to be very sour."

People very often pretend to dislike things that they are not able to get.

THE NEXT STORIES ARE ON PAGE 719.

PRINCE JUAN AND THE CAPTIVE PRINCESS



On the third day of Juan's life in the enchanted castle came a princely maiden, who bathed Juan with a magic water that made him well again. He put on the rich garments and went into the hall where the table stood, and there feasted with the maiden. "I am the daughter of the Sultan of Morocco," she said. Then she vanished, and Juan followed her to her father's palace, where he made the princess his bride.

OLD FAITHFUL GEYSER AND INN



Some geysers in Yellowstone Park are very irregular and the visitor may easily miss seeing them in eruption. Old Faithful, however, can be depended upon. The time between eruptions is from an hour, to an hour and a half. The usual period is an hour and a quarter, and the eruption lasts four minutes.



There are several hotels in the Park, all under the supervision of the government, which fixes the rates they may charge the travelers. This is Old Faithful Inn, named from the geyser near by. The hotel is built entirely of logs and stone and is very attractive. Within a short distance are several other geysers. There are few places where a vacation can be spent more pleasantly than in Yellowstone Park. Pictures by courtesy of the Northern Pacific Railroad.

The Book of THE UNITED STATES

WHAT THIS STORY TELLS US

ONE of the most wonderful playgrounds in the United States, or in the world for that matter, is the Yellowstone National Park. It is under the control of the Department of the Interior, and contains interesting scenery of many kinds. The great geysers and the hot springs are like nothing else in this country. The canon of the Yellowstone River is both beautiful and awe-inspiring. Besides these there are over three thousand three hundred square miles where game of every sort ranges unafraid. No hunting is allowed and elk, antelope, buffalo, bears and mountain sheep and many smaller animals are all to be seen. These animals know they will not be troubled.

YELLOWSTONE PARK, WONDERLAND OF THE WEST

THE Yellowstone National Park lies almost entirely in the state of Wyoming. It was set aside for the use of the people in 1872, and since that time has been under the control of the United States government. There are more than 3,300 square miles of it, and perhaps nowhere else in the world are so many wonders of nature to be found in such a small area.

MAMMOTH HOT SPRINGS WITH THEIR WONDERFUL COLORS

We shall enter the Park from Gardiner, Montana, through the Northern Entrance Gate. We travel in a stage or a motor car through five miles of wild mountainous country until we come to the Mammoth Hot Springs. Here we dismount and follow the guide among the springs.

"The colors! Oh, the marvelous colors!" we exclaim in breathless astonishment, as our eyes wander from the transparent turquoise of the mist-hung pools to the fretted rims of red and orange, of green and velvety brown, over which the warm water slowly trickles, and from these to the dazzling whiteness of the crusted earth beyond, "as pure and clear as any snow field of the Alps." "The lovely tint of the terrace basins is due to a plantlike organism that lives in the hot water," our guide explains.

From Mammoth Hot Springs we

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proceed in the coach by slow and easy stages through a wild, strange place, called the "Hoodoos," or Goblin Land, which tradition says was formed by the Devil sliding down one mountain and his Satanic Majesty's wife down another. The result was this strange region called the Hoodoos. In reality this gruesome place was in all probability formed by a mountain which caved in, partly filling the cavern below. Of late years the government has constructed a road through Goblin Land, but owing to the deep caverns over which it is built this highway sometimes gives way.

Twelve miles beyond Mammoth Springs we drive over a roadway built out of solid glass about the base of Obsidian Cliff. On one side of us lies Beaver Lake, its quiet waters giving us back a picture of the pine-clad hills of its opposite shore; while on the other side of the roadway rises a glistening mirror-like mountain of jet black polished glass. The roadway about the base of this glass mountain was built with great difficulty. As blasting powder could not be used, fires were built around the huge blocks of obsidian, and when the glass expanded with the heat, cold water was dashed upon their surface, shattering the blocks into small pieces.

We are on our way to see the

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geysers. A geyser has been called a water volcano, and perhaps this is as good a description as we can get. Down deep in the earth the hot water collects and the steam becomes so compressed that something must give way. The water on top is forced out, sometimes with great force. The geyser is then quiet for a time, until the pressure again becomes too great, and then there is another eruption.

Driving on we come at last to the Norris Geyser Basin, where the first sight that attracts our gaze is a vast spring of pale blue water called the Congress Pool. It is sometimes quiet, sometimes boiling, and has at different times thrown out mud. We branch off from Congress Pool a little way on foot to visit the Monarch, the king of geysers, in the Norris Basin. We find its mouth, out of which issue puffs of steam and little spurts of boiling water, situated at the foot of a hill of brilliantly colored rocks. But the geyser is not in action, and as it is very irregular, we mount the coach and hurry on to the Lower and the Upper Geyser Basins, hoping for better fortune there.

HELL'S HALF ACRE

Here we dismount and visit a place very aptly termed Hell's Half Acre. So gruesome, so awe-inspiring to the ordinary mortal are the freaks of Nature found in Yellowstone Park that they are almost unconsciously linked in one's mind with the Evil One and his abode. Truly this last region is most suggestive of the place the name of which it bears. Dense masses of steam overhang the land, and a sulphurous smell rushes up our nostrils, leaving us choking and gasping. The air is filled with hissing noises and the very ground on which one treads is hot. We follow the guide, stepping gingerly over the volcanic crust, until we come to a ridge of small basins, which heave and sputter with pasty clay of every imaginable color,—rich cream, vivid orange, brilliant blues, violets and purples, the Mammoth Paint Pots.

We turn with a feeling of relief from the Paint Pots to visit "Excelsior," the largest geyser in the world. It has been quiet for a long time and we only see a great opening filled to overflowing with boiling light blue waters,

surrounded by crusted walls of pearl-like whiteness.

Another geyser of great interest to visitors in this vicinity is the Great Fountain, whose crater is about twenty feet around, and into whose clear blue water we can peer down at least fifteen feet, watching the bubbles coming up from the deeps and breaking on the surface. It plays two or three times a day.

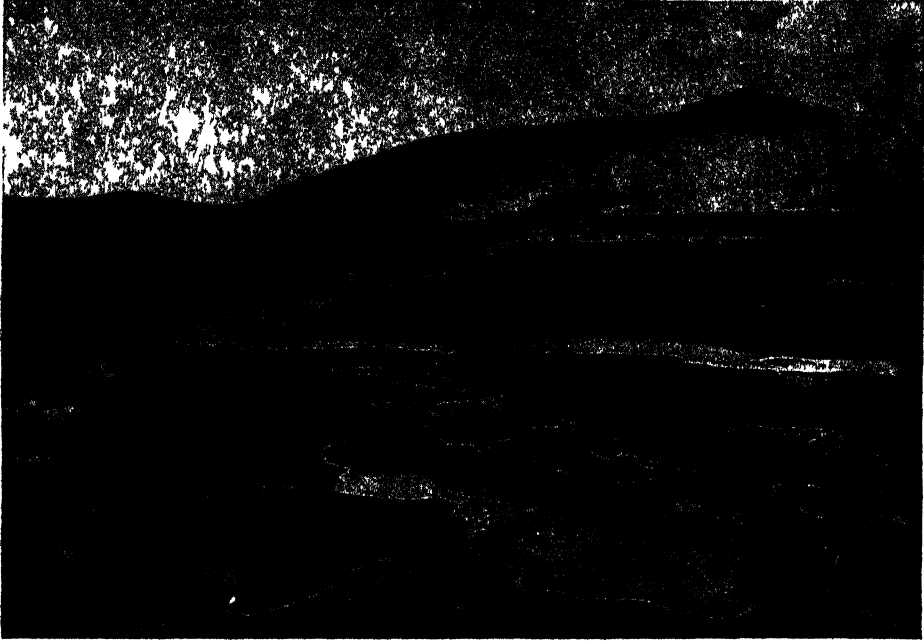
MORNING GLORY SPRING

But most wonderful of all the hot springs is the Morning Glory, which we see when at last we reach the Upper Geyser Basin. It is truly marvelous for the richness and variety of its coloring. "Imagine, if you can, a pool of water, about two feet in diameter, and formed after the shape of the morning glory you have seen in the fields. Imagine those selfsame colors, a little deeper in tone, transferred to this pool, or rather, perhaps, imagine Nature dipping her brush into the delicate tints of an autumn sunset and painting them upon the sides of this pool. Then imagine the whole filled with crystal liquid—we will not call it water, it is far too clear—that gives one the feeling of being solid air—and you have before you the Morning Glory of the Yellowstone."

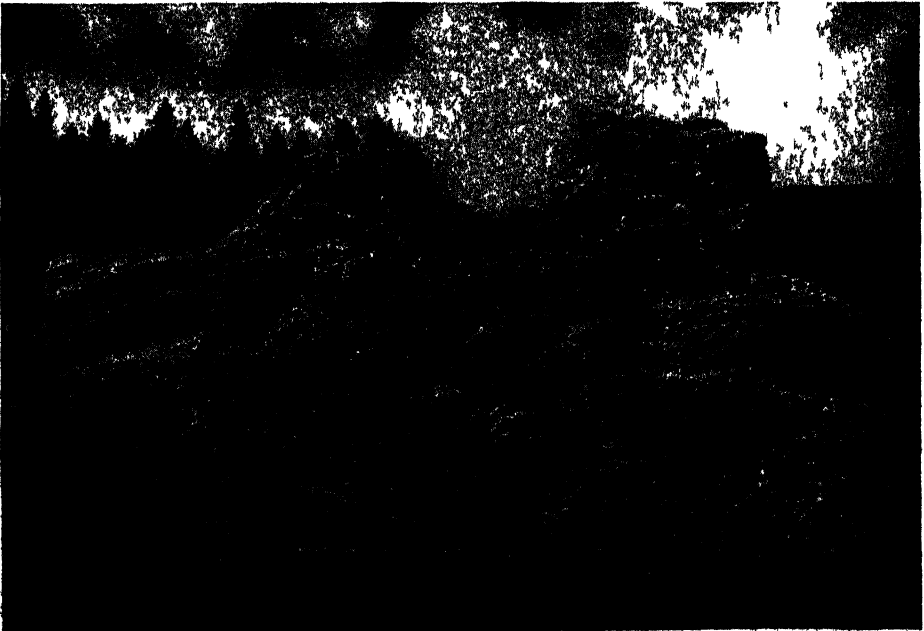
But the hot springs, with their sudden, blinding puffs of vapor and the thin, uncertain crusts about their rims deceptive to the unpractised eye, are as dangerous as they are beautiful. There are many of these boiling pools of water, that sometimes shade off in colorless, clear ripples over the gray sinter. One writer tells of a pitiful little tragedy among the wee creatures of the Park. "Walking along the shore one day," he says, "a baby sandpiper, unmindful of danger, was seen to step into the treacherous pool, where it cheeped feebly to the distressed mother bird, and in an instant was floated off, dead, a tiny ball of fluffy feathers." Small animals are not the only things that are injured by these boiling pools. Cases have been known where people have tumbled into the scalding water and have been seriously injured and in some cases killed.

There are many geysers worth seeing in the Upper Geyser Basin, for it is the

SOME MARVELS OF THE YELLOWSTONE

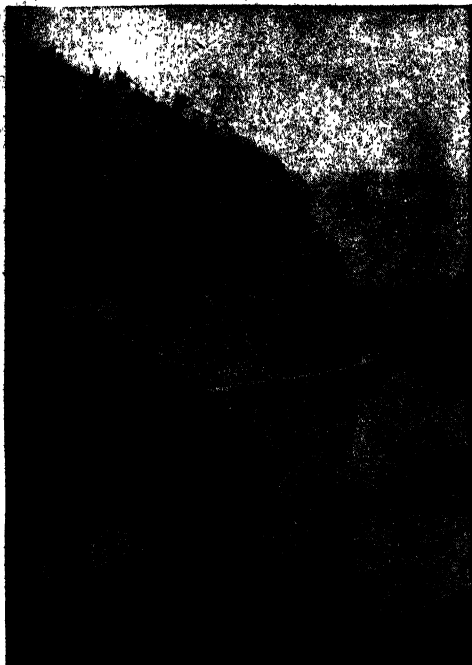


Here is a picture of the Mammoth Hot Springs in Yellowstone Park. Notice how the pools, filled with water which almost boils, rise above one another in terraces. The water of the springs is a deep blue in the centre, and where it flows over the edge of the basins a thousand colors show, rainbow-hued, in the sunlight. Over the terraces hangs a mist of steam, and beyond are the everlasting hills.

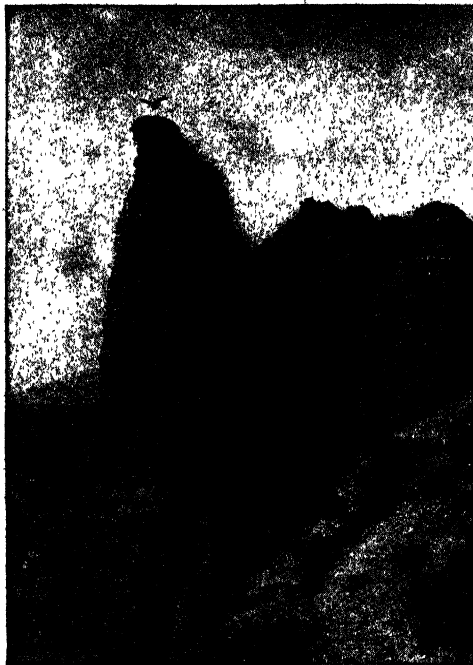


This is the crater of the Castle Geyser, one of the oldest active geysers in Yellowstone Park. The Castle has the largest cone in this whole region. It shoots up boiling water into the air to the height of fifty to seventy-five feet, accompanied by a great roar and mighty columns of steam. Eruptions of the geyser occur about every twenty-four hours for several days. Then it is quiet for a few days.

OTHER SIGHTS OF THE YELLOWSTONE



This beautiful road built into the side of the cliff is in the Golden Gate Canon on the way from Mammoth Hot Springs to the Norris Geyser Basin. The roadbed which juts out is built of concrete.



This high pillar of stone is called Eagle Rock. By a fortunate chance an immense eagle was just alighting when the picture was being made. Note the many different layers of rock in the high pinnacle.



There are more bison, or American buffalo, in the Yellowstone Park than anywhere else in the United States. They live under natural conditions and are increasing in numbers. This small herd is near Mammoth Hot Springs, but the larger herd, several hundred in number, is more than thirty miles away. Pictures by courtesy of the Northern Pacific Railroad.

largest and most active geyser region in Yellowstone Park, if not in the world. We shall not have the time to visit them all, but we must see the Giantess, considered to be one of the most important geysers in the Park. Its eruptions occur irregularly, five to forty days apart, and we give a description of the Giantess in action in the words of one who saw the display. "News of the eruption spread rapidly," he writes. "Every one hastened to the brink of the great pool that was now boiling and acting as though a thousand furies were busily stirring its waters. At times the earth shook and trembled and in the centre of the pool a mass of water shot upward a few feet and then fell back into the seemingly bottomless cavern. Every moment the water became more agitated and loud groans, as of a giant in distress, broke the almost solemn stillness. At last the time came. Quicker than I can write the entire pool was lifted bodily into the air. Higher it ascended and still higher and then shooting upward from the earth the great body rose, a solitary column, the top of which we could not see. The roar was deafening; the clouds of vapor rolled away towards the forests; streams of boiling water ran headlong to the river close at hand. The scene was one of awful beauty. It cannot be described. Its terrible fascination cannot even be imagined."

We try to imagine this scene as we stand by the Giantess, but we only see the gurgling hot water lapping against the sides of the mighty crater, and get puffs of its steam in our faces as the wind blows it in our direction. But though we cannot see the Giantess in eruption, there are many other geysers in the upper basin that are in constant activity. "Old Faithful" is worthy of its name. At intervals of about an hour, with little variation, it pours a mighty column of boiling water and steam; and then sucks it again into its bottomless pit to pour it forth once more. We stand afar off and watch the sunshine playing rainbow lights upon the cloud of steam.

Leaving Old Faithful, we make a hurried trip to several other noted geysers,—the Castle, the Giant, the Bee Hive, the Lion, the Lioness and the Cubs. If we are lucky we may see

one of them in action, but we can seldom know exactly when to expect an eruption. Everywhere a heavy steam hangs warm and moist in the air. The constant roar and grumble of these geysers, combined with the gurgling and chafing of the boiling springs becomes frightful to us.

Leaving the geysers, we turn toward Yellowstone Lake, and come at last to the Upper Falls of the Yellowstone. Two-thirds as high as Niagara, it shoots over the rocks in mighty jets of water and spray, and striking the stones below, gives back a thousand rainbow tints in the light of the setting sun. We do not say anything. We have no words to express the sense of the grandeur and beauty of the place that sinks into our very souls. A short distance beyond we come to the Lower Falls, whose waters, descending from a height twice that of Niagara, thunder over the precipice in a roaring, foaming flood of green and amber. We travel on up the Cañon, and take our stand at last on a rocky ledge to watch the night descend upon the Wonderland. Below us, between rock walls, the Yellowstone River flows for miles until it becomes a narrowing ribbon of green disappearing into the distance.

There is much more to see in the Park. There are beautiful little lakes among the hills; the Tower Falls are almost as wonderful as those we have already seen; and we may turn aside to the petrified forests near by. For twenty miles along Lamar River are many stumps and trunks of trees which have been turned into stone. Specimen Ridge, which rises sharply out of the valley floor, is composed of beds of these forests one above the other.

Nor is this all. Yellowstone Park is the largest refuge for wild animals in the world. No hunting is allowed, and thousands of elk, antelope, and moose, hundreds of buffalo, and many bears, brown, cinnamon and black, wander unafraid of man. They know that they will not be harmed. Even the dreaded grizzly, which is not often seen, does not attack men, unless provoked. Fishing is allowed and the Park is a paradise for the angler. One may remain weeks in the Wonderland and then fail to see all that is interesting.

CONTINUED ON PAGE 779.

KING JOHN SIGNING THE GREAT CHARTER



King John was such a bad king, and brought England into so much trouble, that the barons and bishops forced him to grant a great charter to the people, promising to maintain their rights. There is a little island on the Thames, near Windsor, called Runnymede, where John met the barons to sign the Charter. John was furious, and it is said that he threw himself on the ground and gnawed bits of wood in his rage.

The Book of ALL COUNTRIES

THE HISTORY OF ENGLAND

THE Normans left their mark on England, and their influence works in our life even now. But it was not all real progress after the death of the Conqueror. There were still fightings for the crown, and the throne was all the more insecure because the Kings of England ruled over provinces in France stretching away to Spain. The Conqueror was succeeded by his son, William Rufus, who was succeeded by Henry I. and Henry II. Then came Richard, who was nearly always away fighting. After Richard came John, a bad king, whose reign is important because the real power of the people then began. The barons forced John to sign the Great Charter which gave England freedom and good laws. John's son Henry became king at nine years old, and in his reign the people took another great step forward by founding Parliament, the Great Council of all the people, which has grown until, in our own day, it is the chief power in the land.

THE BEGINNING OF FREEDOM

WHEN Taillefer, the minstrel, led the Normans to victory at Hastings, tossing and catching his long sword as he rode forward on his gay, prancing horse, the words of his bold song were in French. What a roar of deep bass voices as the whole army behind him took up the air!

When the voice of the archbishop rang out in Westminster Abbey two months later, on Christmas Day, asking if it were the will of the people that William should be crowned king, he spoke first of all in French.

But, you say, all this happened more than 800 years ago; how do you know what they said, and in what language?

Look again into that case in the British Museum, where we saw the actual message from the past, in the story of Bede, and in the Anglo-Saxon Chronicle. You will remember that the opened pages tell of the "Angel" boys at Rome, and a great victory over the Danes.

Next to the Chronicle comes a history of the Norman Conquest, in French, written by a man who knew many of those who had fought in the great battle. For many years authors wrote in French, because the king and his court, and nearly all the richest people in England, spoke French. There is an old poem written for the children of those times, in French, with English mean-

CONTINUED FROM 473



ings below, just as in the French lessons in this book. The writer of long ago says that he has so arranged it in order that the children may understand what they are reading, and when to use "son et sa, mon et ma, le et la." Even the accounts of what was done in the law courts, and at the meetings of the Wise Men, who helped the king to govern the country, were all in French. But the use of the language spoken by Bede and Alfred did not die out, as some thought it would, any more than did the English nation, sorely oppressed as it was. By slow degrees the English and their language rose again; Normans married English wives, and naturally their children and grandchildren spoke both French and English.

Slowly the use of French as a separate language passed away, but the English language which we speak now contains many words brought over by the Normans.

Amongst other traces left by the Norman conquerors are the strong square towers, or "keeps," to be seen not only by the banks of the Thames, but at Norwich and Rochester, and many other places. Most of them look strong enough now to stand a siege, and take us back to the days when the nobles shut themselves up in them, and sallied out to make prisoners and to steal and plunder. There was

no redress for the unhappy neighbors. We have already looked at the beautiful little Norman chapel in the Tower of London, where the Conqueror and his family are believed to have attended service, and all over England and the south of Scotland we can find examples of the round arches and beautiful moldings which go towards making what is called the Norman style.

THE MONUMENTS AND PICTURES OF THE NORMAN TIMES

Some of the abbeys and cathedrals are still standing, having been repaired and added to through the centuries since the time of their founding; others are in ruins, without roofs, with grass and ivy showing up green against the grey stone. If we cross over to Normandy, we find many more of these buildings in the old home of the Normans; at Caen, where the Conqueror lies buried, and whence stone came in barges up the Thames to build old St. Paul's; at Bayeux, where the famous tapestry is kept; at Rouen, the old capital of Normandy, and hundreds more.

As we look out these places on the south side of the Channel let us think of the amount of coming and going there was across this "arm" of the sea, which lay in the midst of the dominions of the Dukes of Normandy, who were also Kings of England. Barons and soldiers were constant travelers, for wars were unending then; traders, too, came and went; workmen and builders; fair ladies as brides, as well as the kings themselves, who had often to cross from side to side to look after their possessions. The pictures of the ships of those days, so beautifully painted by the monks in monasteries, suggest small comfort on board, and very little room.

THE KNIGHT WHOSE ARROW KILLED A KING, AND WHO FLED IN FRIGHT

There was a man who fled over the Channel from Southampton in the first year of the twelfth century who must have felt in desperate anxiety for his ship to move quickly. He was a knight, who had been hunting in the New Forest with the Conqueror's son, William, called Rufus, or Red, on account of the color of his hair. Either by accident or not, the arrow he shot killed the king, and the knight was so frightened, he rushed away to Normandy. You can see the

stone set up in the beautiful forest, to mark the spot. But there was no mourning for the Red King; people were glad and thankful when he died.

His brother, Henry I., was king after him. His nickname was Beauclerc, the French for fine scholar. He began well by giving his people, three days after his brother's death, a letter, in which he promised to set right the bad rule of his brother's time, and to keep the laws of Edward and Alfred.

There are many of these letters, or charters, that we can see in the Manuscript Room of the British Museum, promises of all kinds about lands and government, made through many years of history. The earliest belong to Saxon times, and you can find on them many names that you already know, such as Edgar, who rowed on the Dee; Canute, the Danish king, whose flattering courtiers asked him to command the waves of the sea to stop; Edward the Confessor, who built Westminster Abbey.

HENRY THE FIRST, WHO HELPED THE POOR TO GET JUSTICE

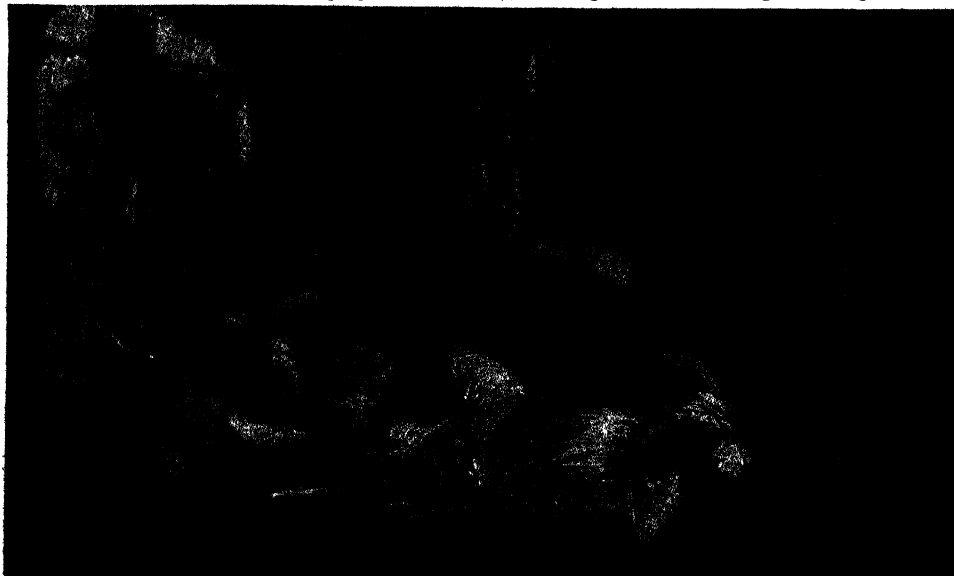
Then you can pass on to those of William I. and his two sons, granting land to various nobles and Churchmen, all with Norman names. Next comes a grant by Matilda, the daughter of Henry I., of land to the lovely abbey at Reading, where to this day the ruins, kept in fine order, can be visited by the thousands of people who live near and work in the great biscuit factories and in the seed nurseries of blazing colors that we can see as we travel past on the Great Western Railway.

Henry had pleased the English very much by marrying a princess who was the daughter of Queen Margaret of Scotland, belonging to the old Royal Family of Alfred and Edgar. They felt now that they had some share in their country, and took heart once more, and hoped for better days. Queen Maud was a good woman, like her mother, and she helped her husband in many ways. He put down the great and oppressive power of the nobles, and destroyed many of their castles. He also helped the poor to get justice. Henry lost his only son, William, when he was eighteen. He was drowned, with a number of his young companions, while crossing the Channel.

THE CONQUEROR'S CORONATION & DEATH



When William the Conqueror reached London, after defeating Harold at Hastings, he was crowned King of England in Westminster Abbey. A great riot immediately followed, owing to the Norman troops outside, when they heard the shouts of the people in the Abbey, thinking that the new king was being attacked.



William had been twenty years in England when he had to visit Normandy, which had been invaded by French barons. As he was riding down a steep street at Mantas, his horse threw him. He was carried to Rouen seriously injured, and died in a monastery. At his death his servants robbed him and fled, and he was alone.

The fine new White Ship, in which Henry had been persuaded to let his son travel, struck upon a rock, and only one of all the passengers managed to hold on to the wreck till morning.

Henry never recovered from the great shock, and though the nobles promised to take his daughter, Matilda, for their queen at his death, it was his nephew Stephen who succeeded him.

THE WAILING OF THE PEOPLE WHEN THE LAND BARE NO CORN

In Henry's reign the Anglo-Saxon or English Chronicle begun by Alfred, and continued year by year in different hands, came to an end. Matilda and Stephen disputed long for the crown. An old chronicle of the time gives an account of Matilda escaping from Oxford with her companions, over the Christmas snows, all dressed in white, so as not to be seen. Fighting went on, and the barons began building castles again, and taking people's property from them and doing as they liked, till all the good that Henry had tried to do in the way of securing peace and quiet and justice was undone. "The land bare no corn," wails the historian. "You might as well try to till the sea as the land, for the wickedness that is done in it."

The King of Scotland was Matilda's uncle, so he was glad of an excuse to make war on Stephen; and there was a famous battle fought in Yorkshire, called the Battle of the Standard, on account of the banners of three great churches of Yorkshire being taken into the fight. The victory was not of much use to Stephen, for the King of Scotland kept Cumberland without owning Stephen as his overlord.

THE POPE OF ROME GAVE IRELAND TO THE ENGLISH KING

When Stephen died, Matilda's son became King Henry II. His wife, Eleanor, was a French princess. She was heiress of three splendid provinces in France, and Henry was in his own right Duke of Normandy and overlord of Brittany, so that his dominions reached from the north of England to the Pyrenees, the great mountains which separate France and Spain. Much as he had, he was always going to war and planning to get more; especially he wanted to be king over the whole of the

British Isles. After restoring order in England, by destroying castles and re-establishing the power of the courts of justice, he made the Scotch king give up Northumberland, Cumberland and Westmorland, all south of the Cheviot Hills. He tried to get Wales and Ireland, but without much success. The only Englishman who was ever Pope lived at this time, and he made Henry a present of Ireland, because it was said then that all islands belonged to the Pope, and that he had the right to do what he liked with them.

Naturally, the Irish did not agree to this. They preferred their own ways, with wild chiefs always struggling and fighting together; and though Henry succeeded in getting some sort of order in the part of Ireland that was nearest to England, things were as bad again, or worse, as soon as he was gone. A French king said of him, with amazement: "The King of England is now in Ireland, now in England, now in Normandy. He may be rather said to fly than to go by horse or boat!"

THE TERRIBLE THING THAT HAPPENED IN CANTERBURY CATHEDRAL

If you go to Canterbury Cathedral you will see the spot where the great archbishop of Henry's time met his death. His name was Thomas à Becket. He had disagreed with the king about some Church affairs, chiefly about how the clergy were to be punished when they did wrong. Henry, in a passion one day, said he wished someone would rid him of the troublesome archbishop. So four men hastened over from Normandy, where King Henry then was, and, taking the king at his word, killed Thomas in his cathedral. The steps that lead to the spot where the archbishop was buried are worn by the knees of pilgrims who for long years went to pray at the tomb of the man who had suffered for defending the clergy against the king.

Henry was not forgiven till he had walked barefooted and bareheaded to the chapel, and received a beating with rods from each of the monks in turn. Before he died he portioned out his great dominions to his sons; but they did not like his keeping the over-lordship in his own hands, and there were miserable family quarrels in consequence. When

THE ARCHBISHOP WHO DEFIED THE KING



Thomas à Becket, the great Archbishop of Canterbury, had a long struggle with King Henry II. about certain rights of the clergy. The king, who was in Normandy at the time, at last flew into a passion, and said he wished someone would rid him of the archbishop. Four knights at once hastened to Canterbury, and in this picture we see them arguing with Thomas à Becket in his palace behind the Cathedral.



As the archbishop would not yield to the demands of the knights they threatened to kill him. He fled into the Cathedral and took refuge before an altar, but the knights followed and murdered him. The steps that lead to the spot where the archbishop was buried are worn by the knees of pilgrims praying at his tomb.

the name of his favorite son, John, was found on the list of those fighting against him, the old man could bear no more. Turning his face to the wall, he said bitterly, "Let things now go as they will. I care no more for myself or for the world."

His son Richard I. then became king. Look at the statue of him set up in front of the House of Lords at Westminster. It is a fine figure on the great strong horse, clothed in armor made of little rings of metal, and holding aloft the long spear he used against enemies far away from England. During the ten years of his reign he was nearly always away, and his wife was the only Queen of England who never entered the country.

The great barons took advantage of Richard's absence to break out again, and the people suffered much from bad trade and bad cultivation of the fields, and from having nearly all the money they had squeezed out of them. Perhaps you are wondering who had the money, and what for?

RICHARD THE CRUSADER, AND HOW HE GOT MONEY FOR HIS WARS

Of all things, Richard loved fighting and adventure best, and in his time the most exciting adventures were to be had in the Holy Land, at the eastern end of the Mediterranean Sea. The country and its capital, the scene of our Lord's life on earth, had fallen into the hands of men who did not believe in Him, and who treated very badly the Christians who went to pray at the spots that were so sacred to them. So the Christians of Europe—French, English, and others—determined to get up expeditions and do their best to get the Holy Land away from those men. Richard I. joined the third of these expeditions, and he needed a great deal of money to pay for the journey.

He even sold a treaty which had been gained by his father from the Scotch king, William the Lion, in which he had acknowledged Henry as his overlord for the whole of Scotland. But Richard did not care; when once the fever and excitement of the Crusades—as these "holy" wars were called—were upon men, they seized what money and arms they could lay hands on, sewed strips of cloth like a cross on their arm, and

hurried off by sea and by land to gain renown in fighting the enemies of Christ. We read the story of these Crusades in the BOOK OF MEN AND WOMEN, beginning on page 59 of our book.

So money was squeezed out of everybody—barons, people, and even the clergy—to pay for Richard's "holy" wars, and to get him out of prison when he fell into the hands of enemies.

RICHARD FORGIVES HIS ENEMY ON HIS DEATH-BED, AND JOHN BECOMES KING

Round the base of Richard's statue, opposite the House of Lords, are shown the scenes of his death at the siege of a castle in France. On one side is the terrible fight going on; on the other the king lies on his bed, pardoning the man whose arrow caused the wound from which he is dying.

Richard's brother, John, was the next King of England. It is difficult to say anything good about him. He seems to have been cruel to everybody, and to have had no friends. When the barons would no longer serve him, he wrung money out of his other subjects, and hired foreign soldiers to fight for him in Scotland, Wales, and Ireland. He had not been very long king when he lost not only Normandy, so that the English kings were no longer Dukes of Normandy, but the other parts of France that had belonged to his mother.

One of the most violent quarrels John had was with the Pope, who exercised as the Popes did then the right of ruling the churches of all the Christian countries, such as France, Spain, Germany, England, and they were very angry if any appointments were made without their leave.

WHEN THE CHURCHES WERE CLOSED AND NO BELLS WERE RUNG IN ENGLAND

So when John refused to accept an Archbishop of Canterbury chosen by the Pope, the Pope sent an order that, till the king gave way, all churches were to be closed; no bells were to be rung calling the people to service; no one was to be baptized, married, or even buried by the clergy. This made everybody very wretched, especially the poor, for they were used to getting help and comfort from the monasteries and clergy. This order from the Pope was called an *interdict*, or forbidding. It seemed as

if a blight were on the land while it lasted, and John only got more and more angry and violent. The Pope made a present of John's throne and kingdom to the King of France; then suddenly John changed his mind, received the archbishop, and restored what he had taken from the Church.

THE GREAT SHAME THAT JOHN BROUGHT UPON THE NATION

And now, see what a humiliation John inflicted on the proud, independent spirit of the nation. To show his submission to the Pope, he took off his crown and handed it to the Pope's messenger, receiving it back again as a gift from the Pope. John's letters about this time are dated from Dover, which reminds us of the story of his riding from place to place, from Windsor to the ports between Sandwich and Rye, and then crossing to the Isle of Wight, anxiously looking for the help from abroad which never came.

In the British Museum hangs a copy of the Great Charter, often called by its Latin name, Magna Carta. Look at it well. It was forced from John, with great courage and difficulty, by the barons. In it he had promised certain rights to the people, so that they might live in safety under good government. This Great Charter, which is often called the foundation-stone on which liberty was built, was drawn up from the charter which Henry II. gave to the people when he became king, which, again, was established upon the laws of Edward the Confessor and Alfred.

THE GREAT CHARTER THAT JOHN SIGNED IN A TEMPER

You would like to hear what sort of promises are made in that cramped Latin writing. Among them are these:

1. The king was not to make the people pay taxes without the consent of the Great Council.
2. No one was to be punished for any wrongdoing without a proper trial according to the law of the land.

There is a little island on the Thames, near Windsor, called Magna Carta Island, and on it John met the barons to put his seal on a lump of wax to show that he "signed" and consented to keep the promises set out in the Charter. He was in a furious state of anger all the time. It is said that as soon as the

deed was done "he threw himself on the ground, gnashing his teeth, and gnawing sticks and straws in his rage."

The Pope supported John and freed him from his promise, and crowds of foreign soldiers came to help John to burn and rob and kill all over the country. It was a troublous time. Louis of France evidently felt he was going to take John's place—you can see amongst the charters a grant from him, giving away the town of Grimsby. Then the end came suddenly.

John had to cross the Wash, that broad inlet between Lincolnshire and Norfolk. When the tide is out there are miles of sands, and the long train of carts and wagons which were carrying the king's treasures were lost in soft quicksands as the tide came flowing in. Quite lately a handsome cup was washed up near the shore of the Wash, and it is believed to be part of this lost treasure of King John.

The grief and worry of it all caused John's death. The whole account of it can be read in the open page of "The History of Matthew Paris," beside the chronicle which describes the extraordinary efforts made to ransom his brother Richard from captivity.

HENRY THE THIRD, THE KING WHO BUILT WESTMINSTER ABBEY

John's little son Henry, only nine years old, was soon crowned at the Abbey—the old Norman Abbey of the Confessor. In one of the illuminated manuscripts in the Museum, gleaming with illustrations in bright colors and thickly-laid-on gold paint, there is a picture of Henry III. holding a model of the Abbey in his hand. The reason for his being so shown is that one of the great works of this king's long reign of more than fifty years was the beginning of the rebuilding of this church. He pulled down the old Norman east end, and built it up again in the new style that had come in, with arches pointed instead of round, and with much higher walls, columns, and roofs.

We can still go and look at this beautiful work of more than six centuries ago. Only part of the splendid tomb Henry set up in it for the body of Edward the Confessor now remains. The golden shrine, and golden statues, and precious stones are all gone. You may think it

looks dusty and dingy now, as you look close into it to see the mosaic or inlaid pattern of tiny pieces of glass; but remember that it has stood there for hundreds of years, and that round it have passed not only generations after generations of quiet folk come to pray in the holy place, or to admire its beauties and read the story of the past, but also rough soldiers and thieves, who tore down the ornaments and jewels, and made sad havoc with what had been the pride and joy of their forefathers.

SIMON DE MONTFORT, THE PEOPLE'S LEADER AGAINST THE KING

It has been said that the great result of Henry's long reign was the giving back of England to the English. It was possible for a poet who lived towards the end of this reign to sing:

Now England breathes in the hope of liberty,
The English were despised, but now they have
lifted up their head.

You will remember that William the Conqueror claimed all the land as his own, and parceled it out as he pleased; and, also, that when he wanted money he forced the people to pay as much as he chose. Now, two centuries later, when Henry III. wanted money for his wars, his buildings, and his foreign favorites, the people were strong enough to refuse to give it to him unless he promised to keep to the Great Charter and rule by the law of the land. In the great fight between Henry and the people about this, the name of a great patriot stands out—Simon de Montfort.

"I fear thunder and lightning not a little, Sir Simon," said Henry to him one day when caught in a bad storm, "but I fear you more than all the thunder and lightning in the world."

HOW THE BISHOPS FLUNG DOWN THEIR CANDLES AT THE KING'S FEET

Before the actual fighting began, Henry made promises over and over again, only to be broken. Let us see and hear how these promises were made on one occasion. A great procession of bishops and clergy, with splendid silk robes, carrying lighted candles in their hands, arrived at the Great Hall at Westminster, where Henry awaited them. Then, standing round him, they spoke strong and terrible words as to what would happen to the king who took away

any of the freedom of the land. As their voices died away—can you almost feel the hush after the loud, passionate talking?—they flung down the lighted candles, saying:

"May all those who take away our rights perish, as these lights perish!"

The king made solemn promises as the candles were relit, and the bells rang out joyfully to tell the news to the people outside.

But the promises were broken, and the country had to fight again, and Henry was forced to draw up new laws and add to the good old ones. The new laws were written in English for the first time since the Norman conquest. Again the king broke his word, and more fighting went on, till at last Simon succeeded in forming a "talking place," called a Parliament, after the French word *parler*, meaning to talk.

This was even more useful than the old Assembly of the Wise Men had been. In it not only barons and bishops could discuss what was best for the country and the people, but knights from every shire had the right to come and talk; also citizens from the towns, and these, too, had a voice to say what the people in their part of the country wanted done, and how they wished the money to be spent which they paid in taxes.

THE CHILDREN'S ENCYCLOPÆDIA OF HUNDREDS OF YEARS AGO

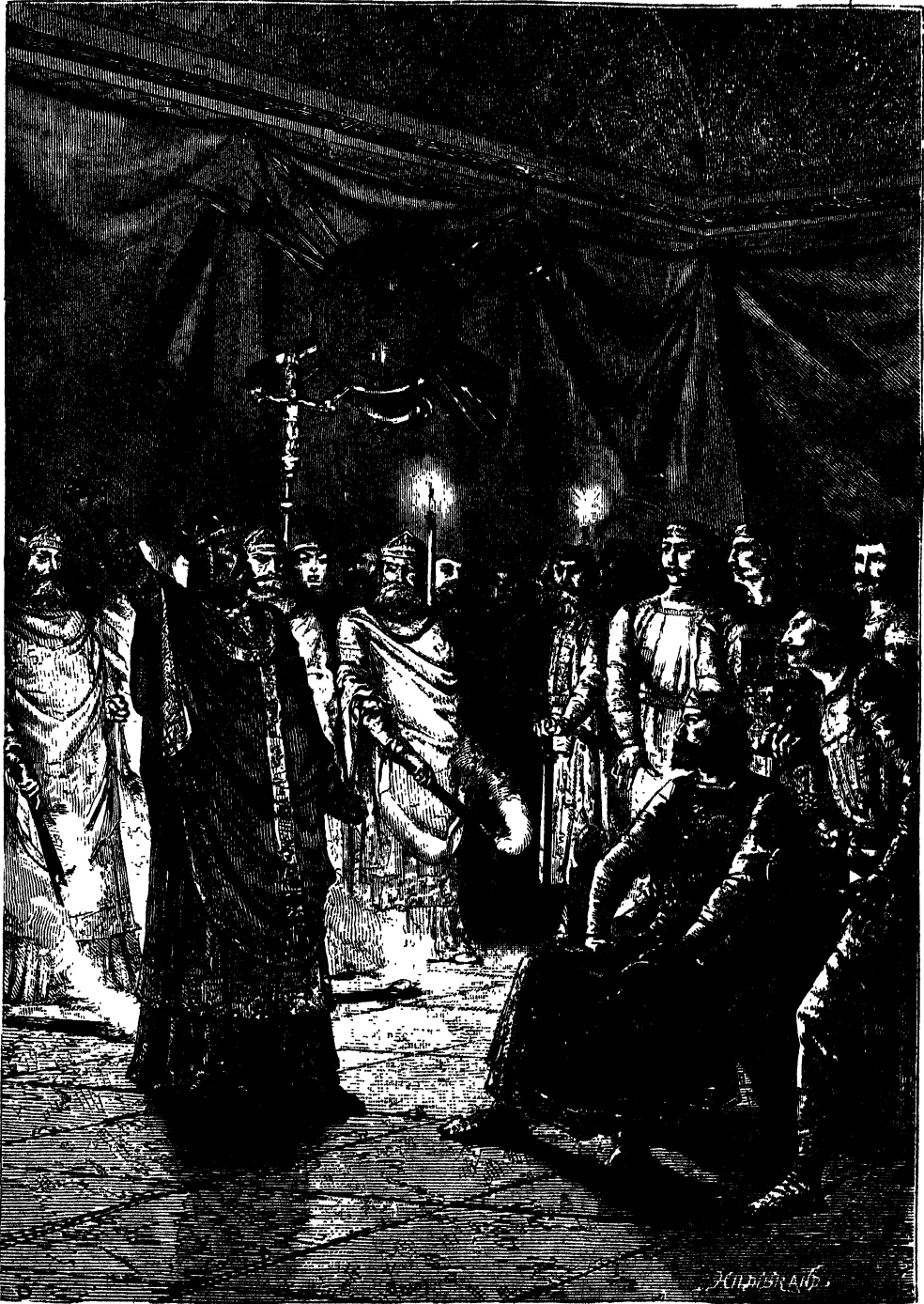
The battle of Lewes was the crowning victory of the barons under Simon. When Henry was taken prisoner at its close, did he think, one wonders, of the words he had said long before about fearing his conqueror?

Three years after this battle a great thinker, named Roger Bacon, wrote a book about every sort of knowledge, which has been called the encyclopædia of the thirteenth century. He speaks of geography, grammar, music, languages, arithmetic, and many other matters. The story of how hard he worked, how he collected his materials, how poor he was, how kind he was in teaching others as poor as himself, is of great interest.

Henry's son Edward helped him at the battle of Lewes; later he went to join in a crusade, for these wars were still lingering on.

THE NEXT PART OF THE HISTORY OF ENGLAND BEGINS
ON PAGE 769.

HENRY III. PROMISING TO OBEY THE LAW



King Henry III. wanted money to carry on his wars, but before they would grant it the people made him promise to keep the Great Charter granted by John. A procession of bishops and clergy, carrying lighted candles, arrived at the Great Hall at Westminster, where the king awaited them. Standing round him, they spoke strongly of what would happen to a king who took away the freedom of the land, and, throwing down their candles, cried, "May all those who take away our rights perish, as these lights perish!"

THE FIRST TRAINS TO RUN IN ENGLAND



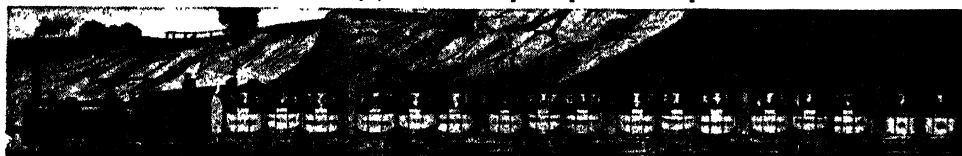
A man on horseback riding in front of the first railway train to run in England.



A race of railway engines at Rainhill, near Liverpool, in which George Stephenson's Rocket won, 1829.



A scene on one of the first railways, which were quite open and not protected from the roads.



How first-class passengers traveled years ago : a train going from Liverpool to Manchester.



How second-class passengers traveled years ago : a train on the second railway built in England.



How third-class passengers traveled years ago, before all carriages were covered in.



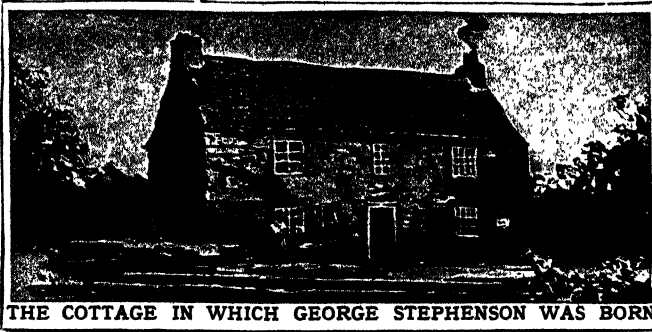
How goods were carried years ago : a freight train from Liverpool to Manchester.



How cattle were carried in the early days of the railways.

SOME OLD PICTURES OF THE EARLIEST RAILWAYS BUILT IN ENGLAND

The Book of MEN & WOMEN



THE COTTAGE IN WHICH GEORGE STEPHENSON WAS BORN

MEN WHO MADE THE RAILWAYS

SUPPOSE when you want to go to the seaside or to visit your friends in the country that there should be no railway to the place. "Such a thing could not be," you think, "there are railways everywhere about the country." You cannot think of a place where there are not railways somewhere near, can you? Well, whenever you hear to-day of anybody being ninety or a hundred years old, you may think to yourself, "That is somebody who was born when there were no railways anywhere in the world."

The first real railway was opened on September 27th, 1825. Until then people traveled as they had traveled for thousands of years. They had to ride on horseback, or in coaches, or else they had to walk. It used to take as long to get from New York to Washington as it now takes us to get from New York to Denver. People on setting out used to say, "This is a very long journey which I have to make, and I may never return, so I had better make my will before I go."

They thought they were almost flying if the coach went along at the rate of ten miles an hour. Once, when a great judge was going from Edinburgh to London, he thought that he would ride in the coach which, by having fast horses ready

CONTINUED FROM 542



to meet it at different villages all along the way to London, would travel the whole journey at the rate of ten miles an hour.

"Oh, don't go by that coach!" said one of his friends.

"But I must," he said.

"Well, if you do, be sure not to go straight through; rest for a day or two at York," said the friend.

"Why should I do that?" asked the judge.

"Well," said the other man, "the rate at which it travels is so great that if you go all the way by that coach it will force the blood up into your head, and you will die. Either go by a coach which is not so terribly swift, or promise me that you will rest at York."

What would he have said if they had told him that the time would come when men and women and children, riding in express trains, would think nothing of traveling at the rate of sixty or seventy miles an hour? He would have thought the person telling him that had gone mad, would he not?

Who made the railways, which have brought about this great change in traveling? It was George Stephenson, one of the poorest boys you ever heard of.

He was born on June 9th, 1781, at a little village near Newcastle-on-Tyne. There were five other children

in the family, so, with George and the other five and his father and mother, there were eight of them altogether. Their father, Robert Stephenson, though he worked very hard as a miner, and afterwards as a fireman for an engine which dragged coal up out of the pit, earned so little money that he and his wife and all these children had to live in a tiny cottage, which had only one room. That one small room was their kitchen, scullery, parlor, bedroom—everything.

HOW GEORGE STEPHENSON BEGAN TO THINK WHILE WORKING AT A COAL-PIT

Children did not have to go to school in those days if their parents did not wish it; poor people's children hardly ever did go, and George Stephenson was like the rest of them. He used to run about the village as a child, instead of learning lessons; then, when he got a little bigger, he set out to earn money by looking after cows. Afterwards he took care of a horse which was kept at the colliery where Robert Stephenson worked.

But, though the boy did not go to school, he was clever. He used to make little clay models of the engine at the colliery, and he got to know so much about the engine that he was employed to look after one which pumped water out of a coal-pit. He loved this work. But he wanted to know more about the engine than he already knew. He could see for himself what there was to be seen, but he wanted to know *why* the fire in the furnace caused the water in the boiler to change into steam, and why the steam was able to drive the engine. He could not understand these things, for all that he wished to know was written in books which he could not read. To be able to read seemed to him the most wonderful thing in the world.

THE MEN WHO HAD BEEN THINKING ABOUT STEAM BEFORE GEORGE STEPHENSON

He knew that if he could learn to read he would be able to learn the secrets of steam-engines such as had then been built. Stephenson himself did not invent the steam-engine, for there was one already in use at the colliery when he first went to work.

For a long time men had been trying to make use of steam. Men in France had tried, and men in England had tried. Each in his turn did a little better than the others, until at last Thomas New-

comen, a Dartmouth blacksmith, who was born in 1663, and died in 1729, made a steam-engine which pumped water out of the mines.

This was a wonderful engine, considering that it was one of the first; but, of course, it was far from perfect. A model of Newcomen's engine was sent to be repaired, and a young man named James Watt was put to work on it. This was in 1765, when Watt was twenty-nine. He easily did what was wanted to make the model work, but he saw that the Newcomen engine wasted nearly all its steam. Watt, who was a very clever man, thought long over this, and in 1769 he invented an engine of his own, which was far better than Newcomen's—stronger, and not wasting so much steam.

Then Watt and a man named Matthew Boulton became partners at Birmingham, and made many engines on the plan of Watt's. These pumped water, but they were fixed; they could not move about. Watt knew all about the science of steam-engines, but poor George Stephenson did not.

THE GREAT GIANT THAT DASHED THROUGH THE LANES AT NIGHT

William Murdock, the man who found out the way to make gas from coal, also knew the secret, and made a toy steam-engine which ran on wheels. Murdock had a friend named Richard Trevithick, who did better than this. Trevithick, who was born in Cornwall in 1771, and died in 1833, made a steam-engine in 1801 which would travel along the road.

One dark night he and a friend, when out for a ride on the engine, dashed up to a toll-gate. The toll-keeper came out to take the money for their toll, but when he saw the engine spouting steam and sparks, he was so frightened that he could not speak.

"How much have we to pay?" Trevithick asked him.

The poor man was in too much fear to answer, so Trevithick asked him a second time.

The toll-keeper flung open the gates.

"N-nothing to pay—nothing to pay—please pass on as quickly as you can," he said.

He thought that Trevithick and his friend were two evil spirits, and that the steam-engine was the carriage which evil spirits used.

THE MEN WHO MADE THE FIRST ENGINES



THE BOY WHO THOUGHT OUT THE STEAM-ENGINE : JAMES WATT WATCHING A KETTLE STEAM
From the picture by Marcus Stone, R.A., published by Messrs Hy. Graves & Co.



YOUNG GEORGE STEPHENSON AND HIS ASSISTANT WORKING A MODEL ENGINE

Trevithick's steam-carriage was the first that ever ran along a road. When that was made, George Stephenson was nearly nineteen years of age. He had just got a situation in which his wages were twelve shillings a week.

STEPHENSON LEARNED HIS A B C WHILE INVENTING THE RAILWAY ENGINE

"Now I am made for life," he said, the money seeming so much. But still he did not even know his letters. He could not bear this any longer. He made up his mind, big as he was, to go to a little school and learn to read and write, to do as a young man what every child in the land can now do.

He had to begin at the very beginning, to learn his A B C, and how to do the simplest sums. He did not mind that. Although he worked hard at his engine from early morning till evening, at night he gladly ran off to his school to do his lessons. He soon learned, because he made up his mind that nothing should stop him.

Having learned to read and write and do sums, he could now read and understand the wonderful books which told him what was known about the making and working of steam-engines. While other young men were wasting their time, George was working at his engine or at his books. If not doing that he would be mending boots. He mended boots so that he might have a little more money, for he had fallen in love with a pretty country girl, and she had promised to marry him as soon as they could save up enough money with which to furnish a little house.

They did save up and get married. They had a nice little two-roomed cottage of their own, and a baby boy was sent to make them still more happy.

THE GREAT SORROW THAT CAME INTO GEORGE STEPHENSON'S LIFE

But great sorrow came to poor George. His wife died. So he went to work in Scotland, walking all the way to Montrose. He stayed there for a year and saved \$140. But he loved his baby too much to be longer away. The boy had been left at home, so Stephenson felt that he must go back. The man who was afterwards to give the world its railways came back from Scotland in the same way that he had gone there—he walked all the way on foot.

When he got home he found that an

accident had made his poor father blind, so George had now to keep his mother and father, as well as himself and his little child. He had a hard time of it. The Army wanted him to go for a soldier, and he had to give up all his little savings and run into debt to be allowed to stay at home and work for his child and his parents. His troubles were so great that he shed tears, and thought that it was of no use trying to live in England, that he really must go to America, where so many other people were going. What a difference it would have made if he had gone. They would have had no railways in England for years and years.

Stephenson was not the man to sit weeping. He got better work, this time at Killingworth colliery, some little distance away from his old home. At this colliery they had a steam-engine working to pump away the water which leaked into the pit. The engine worked so poorly that it could not pump quickly enough. For more than a year it had been at work, yet the pit was still full of water. Stephenson asked to be allowed to try what he could do. They laughed at the idea of his succeeding where better men, as they were supposed to be, had failed. Still, his masters let him have his way.

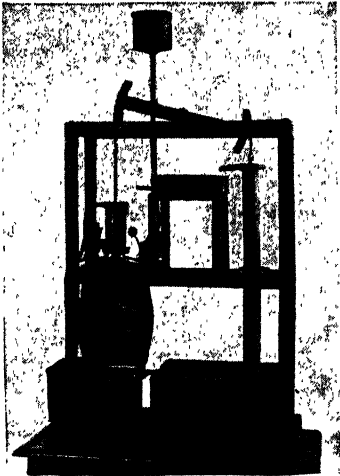
THE FIRST RAILWAY ENGINE RAN AT THE BOTTOM OF A COAL-PIT

He took the engine to pieces, he altered one or two parts, and then set it going. In two days it had pumped all the pit dry. That was a great thing for George, and his employers saw that he was a great deal more clever than the rest of their men; so they gave him charge of all the machinery at the colliery, and paid him five hundred dollars a year. He still worked away at his studies, but there was new work for him to do at the colliery.

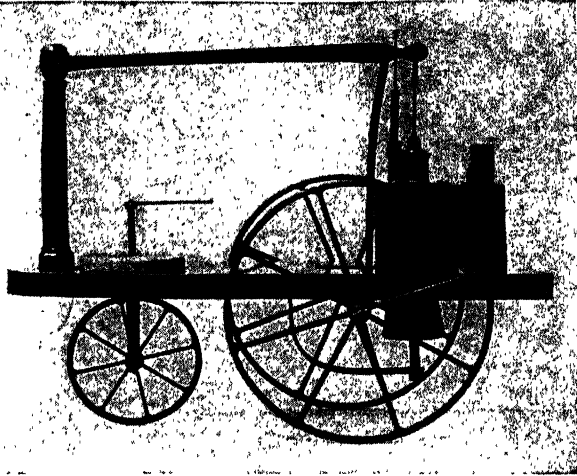
This work was to build a steam-engine to run on rails in the pit, and draw the coal from where it was dug out to the bottom of the shaft, where it had to come up to the surface. So the first railway on which a steam-engine ran began at the bottom of a coal-pit.

There had been rails there before, but the trucks of coal had been drawn over the rails by horses. So well did the engine work that instead of a hundred horses only fifteen were now required.

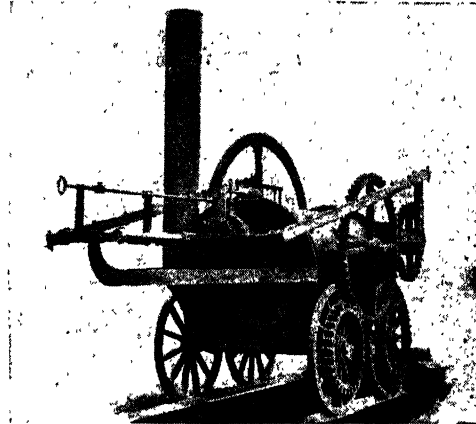
THE FIRST ENGINES & THE FIRST RAILWAY



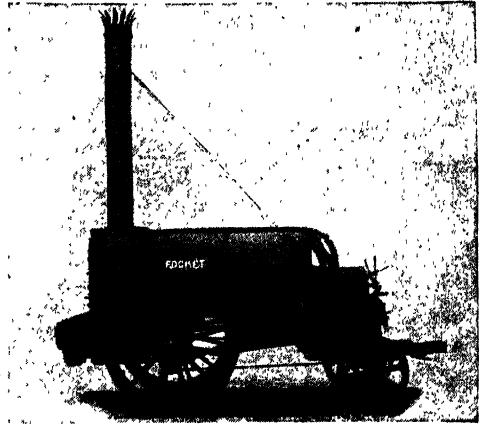
In 1765 James Watt was asked to repair this model engine, and in doing so found out a way to make a better one.



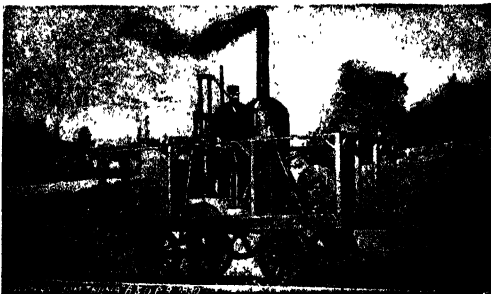
This was the first locomotive engine ever made in England, and was constructed by William Murdock, the man who found out the way to make gas out of coal. It was only a little toy model.



The first steam-engine that ran along the road was made in 1800 by Richard Trevithick in Cornwall. It frightened people, who thought it an evil spirit.



The Rocket was one of the first engines that ran on a railway from one town to another. It was made by George Stephenson, and drew a load of 13 tons.



This is the first engine ever run in America. It was called the Tom Thumb, and was built by Peter Cooper. Small as it was, it could pull forty people eighteen miles an hour, and was run on the Baltimore and Ohio Railroad in 1830. The contrast between this and the great Mogul-Mallet engine, on page 314, shows the progress which has been made in eighty years.



This was the second railway ever made, and was constructed by George Stephenson. There were no station platforms, and the trains seem very small and slow to us now.

It was only a little engine, and not a very good one, so he built others, each one being better than the last. He found time to do other things, too. His little boy was now growing up, so George, who still needed more money than he earned at his work, used to clean and mend clocks at night, so that he could afford to send the child to a good school. Little Robert, who was very much like his father, was a wonderful student at school, and what he learned by day he used to teach his father at night. In time he became a great man, and helped his father in his work, and built engines and railways.

A SAFETY LAMP FOR THE MEN IN THE MINES, AND THE FIRST RAILWAY

Besides making engines and mending boots and clocks, and learning from books, George Stephenson also made a famous safety-lamp. At that time men had to work in the mines with candles to lighten the darkness. Dangerous gas often escapes into the pit, and when this happened in those days, the gas, meeting the flame of the candle, used to explode, killing many men and wrecking the mine. Stephenson tried and tried until he was able to make a lamp which would not explode. This was such a great thing that kind friends made him a present of a thousand pounds.

He was now becoming famous, and the owner of another colliery engaged him to build engines for him. George made five engines, each of which could draw a load of sixty-four tons along the rails.

When George Stephenson was forty years old, a gentleman named Edward Pease made up his mind to build a railway from Stockton to Darlington. He meant to have the trains drawn by horses, but Stephenson went to him and asked if he might build engines to draw them. Mr. Pease was surprised at the suggestion; but he went to see George's engines at work, and said that he would have one for his railway.

A MAN ON HORSEBACK RODE IN FRONT OF THE FIRST TRAIN

So George left the colliery for ever, and set to work to have the rails laid and to build his engine. He spent his £1,000 to help in starting a business to build engines and railway trucks, and from this workshop came the first engine to draw a train.

The work was finished by Tuesday,

September 27th, 1825, and thousands of people were at Stockton to see the train start. They thought that the thing would be a failure, and wanted to enjoy the fun. But there was no failure. The train, made up of six small cars carrying coal and flour, and one coach for passengers, moved off with George himself driving the engine.

A man on horseback rode in front of the train, waving a great flag. He thought that he would be able to lead it all the way, that the train would never go fast enough to pass him. But presently George made a signal to him to get out of the way, and set the train going at fifteen miles an hour, although the weight which the little engine drew was nearly ninety tons.

It was a happy moment for Stephenson when the train reached Darlington without accident. The coal was left, and the train started back, carrying only passengers. When Stockton was reached, it was found that about 600 people were riding in or hanging on to the trucks.

THE WISE MEN WHO THOUGHT THE TRAINS WOULD BLOW UP

That was the first time in the history of the world that a steam-engine had drawn a train carrying passengers over a railway, and the man to do it all was the poor boy of other days who had been glad to earn pennies by minding cows, and to learn his A B C while other young men of his age were wasting their time in drinking places.

Of course, after this, Stephenson became very famous, and he was at once called upon to build a railway between Liverpool and Manchester.

He was not afraid of the work, though he had many trials. First of all the consent of Parliament had to be gained before the railway could be built, and the silliest things were said against the work. Great men declared that the engines would burst and blow the trains and the passengers to pieces, or that, if they did not do this, they would set the countryside on fire; or that their smoke would poison all the cows and pigs and hens, and all the birds would drop dead as they flew over the railways.

The papers were as bad as the people. They all wrote against Stephenson and his works.

"You might as well expect people to let themselves be fired off on rockets

as trust themselves to steam-engines and railways." That is what one of the papers said at the time.

But people did trust themselves to railways. Stephenson, remembering this talk about rockets, called his first engine for the Manchester and Liverpool railway "The Rocket."

THE LITTLE ENGINE THAT STARTED THE WORLD'S RAILWAYS

For the opening of that railway, several engines were sent. The company promised £500 reward to the man who made the best engine for their work. When all was ready there was a public trial of the engines. The others were not nearly so good as George's splendid little Rocket. They broke down on the run, or could not go fast enough. His did all that was required to win the prize. It had been built at his own works, and his joy was very great because his son Robert had made the improvements which enabled it to gain the prize. The Rocket drew a load of thirteen tons at as high a speed as twenty-nine miles an hour.

It was only a little engine drawing a little train on quite a small railway, but it was the day of small things. Little beginnings have great endings. From that time George Stephenson became gradually richer and richer. His son worked with him. They made engines for all parts of England, for railways which they built.

THE POOR BOY'S ENGINES WERE ORDERED BY KINGS

Foreign kings sent for them to build railways in Europe, or to advise them how to do so for themselves. From George Stephenson's works engines went to all parts of Europe, and he made a fortune, and lived to see his son even more successful than he had been. They never forgot that they had been poor, but helped others who were as poor as they had been, and did great good all the rest of their lives.

Since that day many men have carried on the work of building railways. Isambard Kingdom Brunel, who built all the bridges and tunnels on the Great Western Railway, helped his father to make the famous Thames Tunnel. In boring their way they found that the earth and water would rush in, so the younger Brunel invented a wonderful shield. He watched a poor

little worm at work in the water, and saw how it made its way into timber. As it ate its way into the wood it built round itself a tube, which became hard like lime, and so made a safe path for itself. And Brunel did something like that for his father's tunnel. He made a tube of steel, which was driven into the earth, and so kept it from tumbling in. Then between the tube and the earth above he forced in cement, which set as hard as rock. Had he not learned this secret from the worm, he could never have made the tunnel, and perhaps the tunnels under the Hudson River might not have been built.

ENGINES THAT RAN IN THE UNITED STATES IN EARLY DAYS

The United States was not far behind England in building railroads, and the need was greater because of the longer distances. Several engines were ordered from England as soon as Stephenson's "Rocket" was seen to be a success. Their names were The America, The Stourbridge Lion, The DeWitt Clinton, The John Bull and the like. The first American built locomotive was the "Tom Thumb," which was constructed by Peter Cooper for the Baltimore and Ohio Railroad, and began to run 1830. It was so tiny that it was little more than a toy, and makes us laugh to look at it, but still it could run eighteen miles an hour, while pulling forty people.

Soon the "Best Friend" was built for the South Carolina Railroad, but the real beginning of the manufacture of locomotives was in 1832, when Matthias Baldwin of Philadelphia built the Ironsides, and the business which he began has grown until it is the largest in the world. The engines have also grown. The first ones made weighed four to six tons, while now many weigh fifty times as much and can pull a load of thousands of tons at a good rate of speed. Compare the Tom Thumb shown on another page with the monsters which run on the Western railways, of which pictures are shown in another volume. You will then realize the progress which has been made in this branch of manufacturing. These great engines have allowed much longer trains, and have required much heavier rails and better roadbeds. Nowhere else are such heavy trains run as in the United States.

THE NEXT STORIES OF MEN AND WOMEN BEGIN ON PAGE 663.

THE HOMES OF MAN IN ALL AGES



Here we see the first buildings that men made. At first they were simply huts in trees, or holes in the earth. One picture shows an underground house; others show huts built on lakes, and little clay-brick huts with small doorways, which were the beginning of proper houses. At the bottom is the inside of a house in Rome, and the last picture shows an enormous stack of houses, one above the other, in New York.

The Book of WONDER

HOW TO READ THE QUESTIONS

SO many questions come for the Wise Man to answer, and so many of them are related to one another, that the only way to answer them sometimes is to group them together. Many boys and girls who have asked questions about buildings, and water, and sand, and iron bars, will find their questions answered in these pages, where the Wise Man talks about buildings; and these pages should be read through from the beginning and not each question by itself. Where a question stands alone, it is answered by itself; but when many are related to one another the answers to them must be related too. So the best way to read the **BOOK OF WONDER** is to begin at the beginning each time and go to the end, instead of picking out questions here and there and reading them separately.

WHAT HOLDS A BUILDING UP?

OF course, said the Wise Man, we all know that mortar holds the bricks together; but we must remember that the wise builder uses the *weight* of his bricks to make his building strong; and since it is the earth, with its steady pull, that gives bricks, and all other things, their weight, we must not give the mortar all the credit. No bricks and mortar would ever make a strong building if there were not the earth's pull to bind them all together, or if the builder forgot it.

WHY DOES A STICK HOLD TOGETHER?

Mortar, as you know, "sets hard," like many other things—jelly and water included—if you give them a fair chance. And the power by which it, or paste or glue, holds things together is called *cohesion*—a word which simply means *sticking together*. We cannot see what really happens, but cohesion is one of the commonest things in the world. When you move one end of a stick, why does the other end move? Because of cohesion between all the parts of which the stick is made. All the parts of the stick hold together as if drawn to each other by a magnet.

WHY CAN'T WE MAKE A ROPE OF SAND?

Ah! said the Wise Man, that is the whole point. You can't make a stick or a rope of *sand*, and you can't build with bricks and sand. The

CONTINUED FROM 519



sand has no cohesion, except just the least little bit when it is wet. Have you ever thought why sealing-wax melts when it is heated? The truth is that cohesion is one of the most important things in the world, and that the world itself, indeed, could not exist as it is without cohesion. Everything that we call solid is solid because the tiny parts of which it is made stick or hold together. A piece of sealing-wax, for instance, if it is left alone, is held together by cohesion. It does not spill itself and run all over the table, and if you lift it up by one end the other end comes too. But if you apply heat to the sealing-wax it begins to run—it begins to lose its stickiness, or cohesion. This shows a second state in which anything may be, and this state we call liquid. Running water is liquid.

WHY DOES WATER RUN?

That is cohesion again; water runs because it has no cohesion, or else very little. While all solids have a great deal of cohesion—without which they could not be solids—liquids have very much less. But all liquids are by no means the same. Liquid water has very much less cohesion than liquid sealing-wax or liquid gum, which, indeed, has so much cohesion, or sticking together, that we appropriately call it "sticky." On the other hand, liquid alcohol or

liquid air—did you know that air could be liquid like water?—has very much less cohesion even than liquid water. But there is a third state in which anything may be, and that is the state of a gas—like air in its ordinary state, like the water which comes out of our noses when we breathe, and like the gas we burn for light. Now, the thing which marks a gas is that it has no cohesion at all—it runs wherever it can. However big the space that it is in, the gas always fills it. It goes under doors, out at chimneys, and out at windows, and so on. It has no cohesion.

HOW DOES A BAR STAY IN ITS PLACE ?

All solid things have cohesion, and we can almost imagine the tiny parts of which they are made holding on to each other, as if they had little arms or hooks. That is why things can be solid; that is why they can have a shape and keep it. You see, the earth is so enormous, compared with anything that we can make or move, that, if there were nothing else to act against the power of the earth's gravitation, everything would crumble down quite flat, so that all the stuff in it might be pulled as near as possible to the centre of the earth.

A bar holds together, said the Wise Man, because, though gravitation is always acting, and is very powerful, cohesion is very powerful too. You know, for instance, the horizontal bar in the gymnasium? How does this stand? How does it come to stand so firm that it will support your weight? The answer is that, though the earth is pulling it down all the time, the earth's pull is balanced by the cohesion of the bar. If you tried to make the bar of something that has very little cohesion, like sand—well, you might try for a very long time before you succeeded! Of course, it is true that gravitation acts between everything and everything else. It acts, for instance, between the tiny parts of which the bar is made, or of which the bar of sand—if such there could be—is made.

WHY DOESN'T THE EARTH PULL A BAR DOWN ?

You are right to ask me that, said the Wise Man. Gravitation acts upon all things, and we must remember that,

just as the earth pulls everything towards it, so *every part* of everything pulls every other part. But do not imagine that it is this attraction between the parts which explains cohesion, for this attraction is found in a gas, which has no cohesion, and in the wooden bar, which has this cohesion; yet the earth is so enormous, and therefore pulls so hard on all parts of the bar, that the tiny little pull of the parts of the bar towards each other would go for nothing if it were not for the great strength of cohesion.

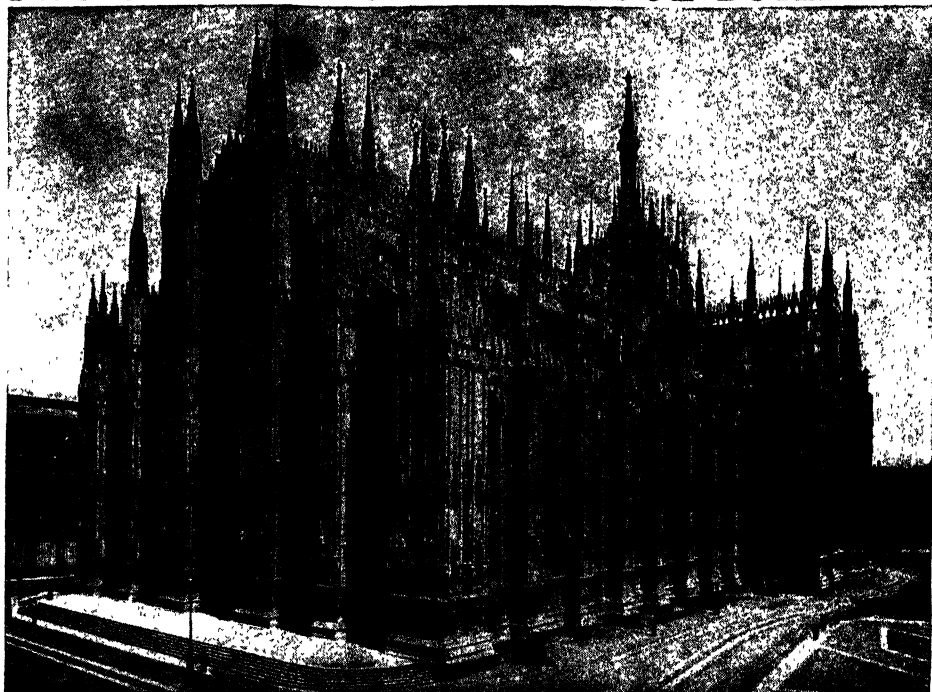
Cohesion, however, is a wholly different thing, and entirely depends on the way in which the parts of anything catch hold of each other. Thus anything you can name may have cohesion at one time, like ice; may have less cohesion at another time, like water; and may yet at another time have absolutely no cohesion at all, like water-gas or water-vapor. Yet in all these three states—solid, liquid, and gaseous—the attraction due to gravitation is acting all the time.

IS THE EARTH'S PULL STRONGER THAN ANYTHING ELSE ?

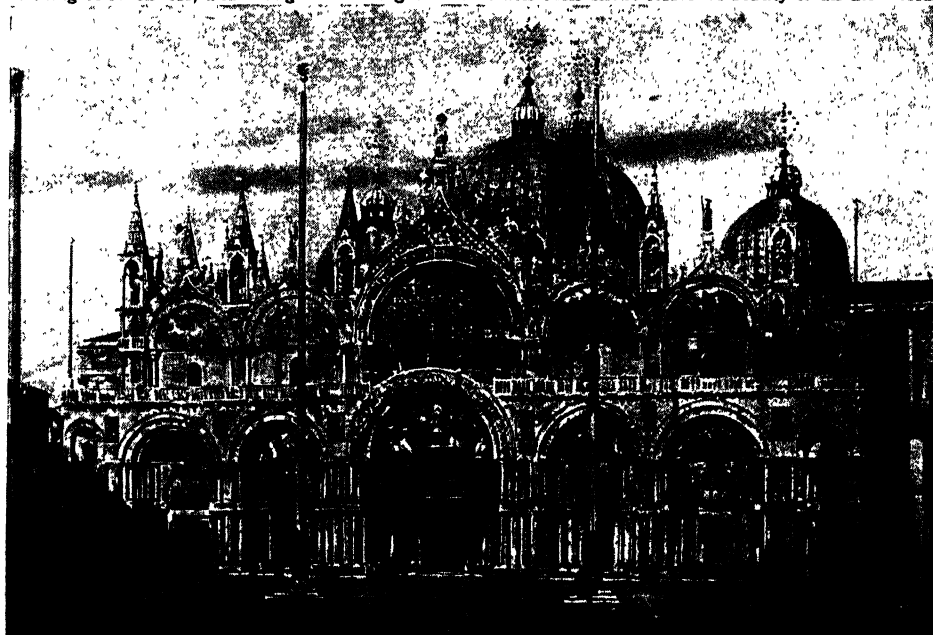
Nearly everyone thinks that gravitation is one of the most powerful forces in the world. This is not true, and we only think it because we think of the gravitation of the earth, which is so enormous; but we forget that when we lift a poker by one end the other end follows, even though the whole earth is pulling it down, because the force of cohesion, or sticking together, in the poker is more powerful than the force of the earth's gravitation.

And now we can go back to buildings. The picture on page 609 shows us two of the most wonderful churches that have ever been built. They are in very different styles of building—St. Mark's at Venice belonging to a far older style than the great marble cathedral at Milan—yet they are both wonderful, and none of us can realize how extraordinary they must appear to people who have never seen buildings of such a kind. They are wonderfully high, for instance, compared with simple buildings, and they have wonderful galleries and arches and domes, some of which almost look as if they were resting upon nothing. But really we cannot understand how wonderful buildings like these are unless we

TWO OF THE MOST WONDERFUL BUILDINGS



One of the things no man can describe is the white marble cathedral at Milan, so wonderful a thing that it might have been built by fairies. It is said that there are a million points on this cathedral, and 2,000 statues. It is as if men had cut up a marble mountain into small pieces, fashioned each piece into a thing of loveliness, and brought them together to teach their silent lesson of beauty to all the world.



There are some buildings that make us wonder, some that make us feel. St. Mark's Cathedral at Venice, of which this is a picture, does both these things. It is so soft and beautiful, and yet so vast, that we feel we are dreaming when we look at it. Most of it was built up inch by inch, with small pieces of marble of many colors, making pictures that are part of the building itself. It has stood nearly 1,000 years.

remember what man's first buildings were like.

WHAT WERE THE FIRST BUILDINGS LIKE?

Well, said the Wise Man, I think that the first things men ever lived in began by not being buildings at all; they were just holes or caves in the earth. We have found some of these caves with bones and teeth and other things which tell us what these men had for dinner long ago. The first attempt that man made to build, I think, was simply to make the caves that he found rather bigger and more convenient; and so he scooped them out and made them deeper, and often he scooped away much of the roof so as to make the cave higher, and let him stand and walk upright in it. And when at last man began to build for himself, he made huts, such as many men live in even nowadays, like the Eskimos. And these huts are really very like caves if you come to think of it. Like caves, they have only one storey and only one room, and no chimney. Men were a long time in rising from the use of these early huts to such cathedrals as those of Milan and St. Mark's.

WHAT WAS THE FIRST GREAT BUILDING?

In time man learnt to use stone, and even to make artificial pieces of stone which we call bricks, and, of course, with these he could make fine buildings; and some of these, though they were built thousands of years ago, and are far older than the cathedrals in the picture, are not less beautiful.

Everyone agrees which is the finest building ever made before the time of Rome, and before civilization reached Italy. This is called the Parthenon, and, indeed, so far as beauty is concerned, it still is the finest building in

the world, though far from being the most wonderful as a building. You may see in the Metropolitan Museum a model of this temple as it was in its full beauty. The Parthenon was built about 500 years before the birth of Christ, in the greatest age of Greece. It was built entirely of white marble, and the figures of horses and men that ran round it outside were made by Phidias, the greatest sculptor who ever lived. Many of these were moved away by Lord Elgin, and are now in the British Museum, where they are known as the Elgin Marbles.

WHO INVENTED ARCHES FOR BUILDINGS?

I am glad you ask me this, said the Wise Man, because it is one of the remarkable things about the great buildings of Greece that they do not have arches. Their buildings, indeed, were in principle the same as you can make with toy bricks. Now, it is a curious thing that somehow or other, though the Greeks learnt so much from the Egyptians as regards science and art and many other things, they did not know about the arch. Yet, even in very early Egyptian buildings, we find various kinds of arches, including even the pointed arch which you must have seen in many churches. Now, I wonder whether you have heard the word "keystone"? There are two kinds of arches—one is like this:

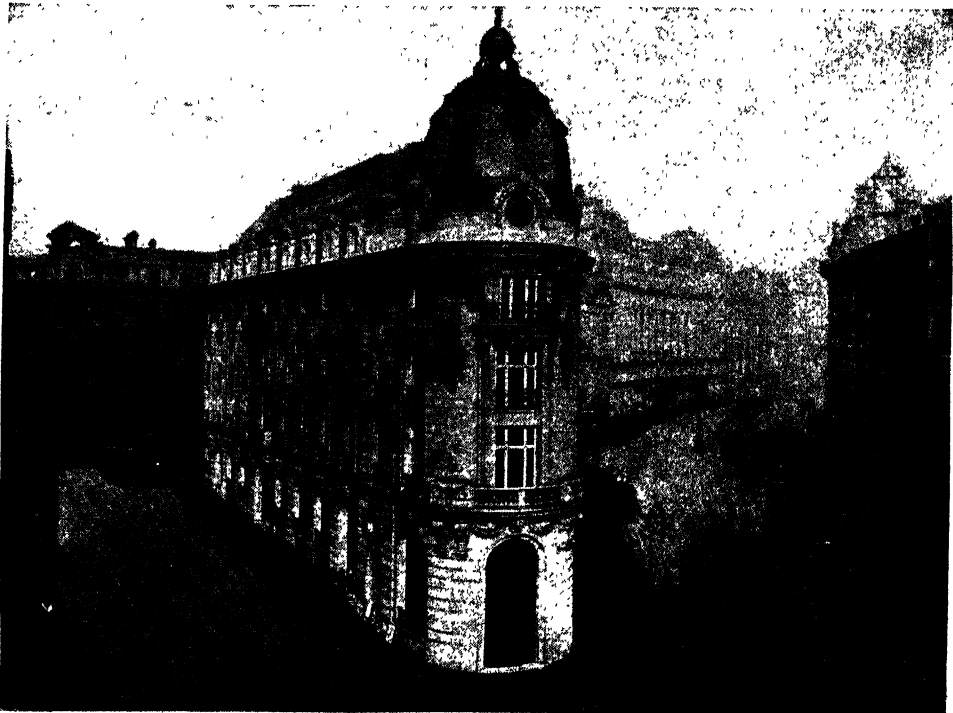
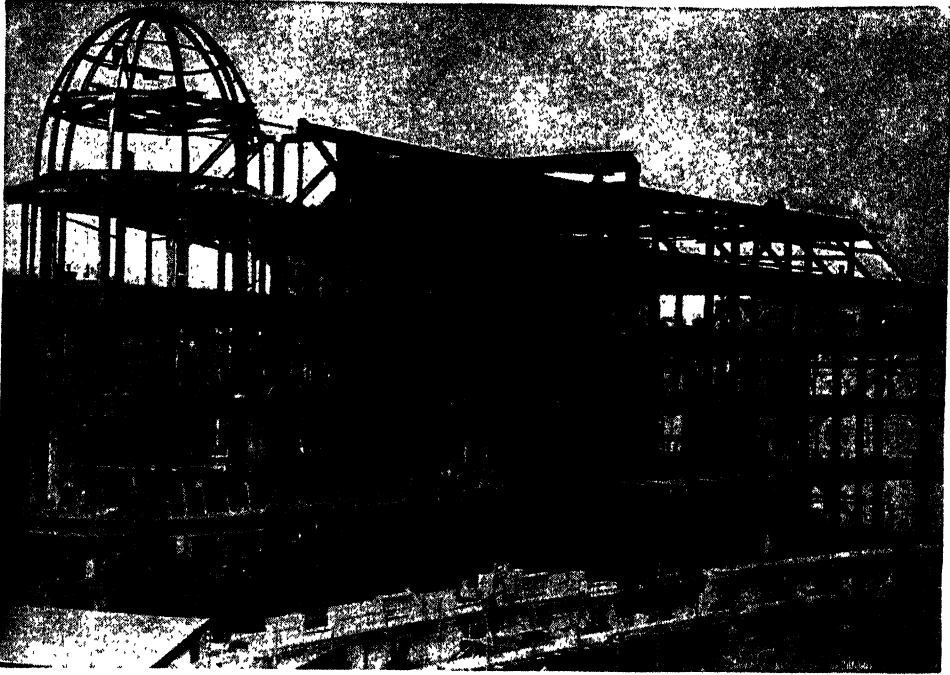


and the other is very interesting, for it is built up from the two sides, and then at the very top of the arch there is put in, last, a stone called the keystone, because it keys, or, rather, locks, the two sides of the arch together. People who study buildings say that the kind of arch they call Gothic does not have a keystone, the two sides meeting in a straight up and down line.



A GREAT LINE OF ARCHES BUILT BY THE ROMANS, WHO WERE FOND OF ARCHES IN BUILDING

THE STEEL SKELETON OF A BUILDING



This is what is called the "skeleton" of a building. Several years ago there was introduced this new idea in building, namely, to make a framework of steel and cover it up with stone. Many great buildings have since been erected in this way. Sometimes in a building there is so little space between the windows that it looks as if the building must come crashing down ; but the strength is in the steel, which we cannot see, and not in the outer covering, which we see. In fact, sometimes we see the stone sides in place on the upper floors, while below the great steel beams are still bare. Sometimes the ground floor seems chiefly windows.

WHO WERE THE BEST BUILDERS?

Now, you know that the Romans came after the Greeks, and that nearly everything they knew and could do they learnt from the Greeks. Indeed, I am afraid that there was a great deal which the Greeks knew and the Romans forgot. Now, the Romans did not build so beautifully as the Greeks. There never was any building in Rome so lovely as the Parthenon. But one thing the Romans had which the Greeks had not, and that was the arch. I do not think anyone knows whether some Roman found out all by himself how to make an arch, or whether they found arches in Egypt, or somewhere else; but, at any rate, somehow or other the Romans had the secret of the arch, and they seem to have been very proud of it, and used it whenever they could.

They were very fond of building what they called triumphal arches in honour of some great soldier or some great event, and you will see such arches in Rome and many parts of Italy. The Washington Arch in New York is the same sort of thing.

In our own times we have made a great discovery as regards buildings. You know that instead of building ships of wood we build them of iron and steel. Well, we do the same thing now in building; instead of stone we use steel.

WHY ARE HOUSES NOT MADE OF IRON?

Indeed, said the Wise Man, I think we are doing just what men did long ago when they passed from the "Stone Age," in which they used stone for knives and weapons, to the "Age of Metals," when they used bronze and copper and iron. I think that we may say we are passing from the Stone Age to the Age of Metals in buildings.

Of course, in the case of a bridge, we simply use steel and do not think it necessary to do any more. The most wonderful, though not the most beautiful, bridge in the world is the Forth Bridge, which is made of steel, and which in one part runs clear a third of a mile over water. Now, that is all very well, but when it comes to ordinary buildings, such as, let us say, an hotel, the builder is rather in a fix. He makes his building of steel; but we are not accustomed to buildings made simply of steel, and they would look very queer to our eyes;

so after he has made the steel skeleton of his house, or of his hotel, or whatever it is, he covers it all up with stone, so as to make it look as if it were really the stone that was holding it up; yet really you might take all the stone away, and the thing would stand as before. Sometimes, too—and this is funnier still—the builder wants to have a lot of shops with big windows along the street below his hotel, and he leaves so little space between the windows that it looks as if the whole thing must come crashing down. There is so little stone showing that it looks as if the hotel were built on glass, though really, of course, it is a huge skeleton of steel.

WHAT IS THE SKELETON OF A HOUSE?

The skeleton of a house is the framework underneath the outer covering which we see. Really we are waiting for some very clever man with an original mind who will be able to make a modern steel building without having to face it with stone and pretend that it is made of stone. Of course, anyone could do this, only the building would look so ugly. We have not yet learnt how to treat the steel so as to make it look beautiful. I am sorry I cannot tell you how to do this, said the Wise Man. If I could, I should be the genius we are all waiting for. But he will come; and if we do not yet know how to make steel buildings that are both beautiful and useful, it was, after all, just the same when men began to use stones and bricks.

WHY IS IT DARK AT NIGHT?

If you take a ball and hold it near a bright light, said the Wise Man, the half of the ball next to the light is shone upon, and the half of the ball away from the light is dark. If you mark a spot on the ball, and then turn the ball round and round like a top, that spot will be shone upon half the time and will be in the dark the other half of the time. We live on a big ball called the earth, which is always spinning round and round, and it is shone upon all the time, day and night, by a bright light called the sun.

The place where we live is like the spot on the ball, and as the great earth-ball spins, part of the time we are on the side next to the sun and part of the time we are on the side away from the sun. When we are on that side it is

dark at night, but while it is our night it is daytime for the people who live on the other side of the ball. However dark it is where we live, the sun is always shining somewhere, and the earth is always traveling towards it or away from it. The sun does not come to the earth, but the earth comes into the sunlight. If you think of the ball and the light you will understand that, however dark it is, the earth will soon carry us round into the light again. Have you ever heard one of the most beautiful lines in all poetry: "There is a budding morrow in midnight," meaning that every night a day is being born?

HOW BIG IS THE WORLD?

The Wise Man told the children the story of the earth, which is given in another part of our book. The world, he told them, is nearly round. From the North Pole to the South Pole, straight through the earth, the distance is about 7899 miles. A pole thrust through the centre of the earth, from side to side, would measure about 7925 miles. The distance right round the outside is about 24,850 miles.

The round world is a vast mass of land and water, surrounded by air. It spins like a top, it travels round the sun, and it moves forward with all the stars in the heavens—forward and forward, for ever and ever. So tremendous is the size of this huge globe, that the mighty range of mountains which we call the Alps are only like the burrowings of a mole on the ground.

Now, if the Alps are so small in comparison with the size of the earth, how much smaller must man appear? He is like a speck of sand.

IF MAN IS SO SMALL, HOW DID HE CONQUER THE EARTH?

Man conquered the earth, on which he is like a speck, because he is not content to stand still like the Alps. Though he is so much smaller than these mountains, he has a brain which enables him to triumph over the weakness of his body and the smallness of his size. He can move; he can think; he can manufacture.

You can imagine how, in the far distant past, our savage ancestors would watch birds sailing through the blue air over the deep waters, and long with all their souls to have that power of flight. For one of man's chief qualities

is *curiosity*. Man is always wanting to find out things. And naturally the first thing he most wanted to find out was the kind of earth on which he lived. So our early ancestors looked across the waters, and dreamed of lands on the other side of the globe.

The curiosity of men is the beginning of geography, for curiosity led men to look about them and observe the earth. When they had learned to build ships, they sailed across the seas, visited many foreign lands, and returned with descriptions of those places and the people they had lived among. These descriptions we call geography, and they are given in the Child's Book of the United States, beginning on page 8.

WHY ARE THE RAINDROPS ROUND?

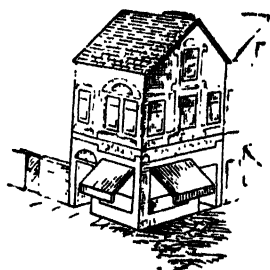
I think that really you should have first asked, Why does the rain form drops at all? We know now that there is always something which we may call a speck of solid stuff in the inside of a rain-drop, and when the drop was made it was made by the water-gas or water-vapour in the air turning liquid upon this solid speck, as steam from boiling water turns liquid on a cold plate held above it.

But you want to know not merely why the raindrop forms at all, but also why, when it is formed, it is so nearly round. The answer is the same as the answer to the question why water forms in round drops on a plate, and the question why it runs in drops down the window-pane when it rains. When water turns liquid it really consists of a kind of crowd of tiny parts, each of which is itself a part, or particle, as we say, of water, just as a human crowd is made of men and women.

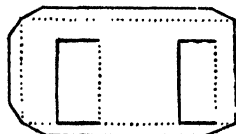
Now, these little particles of water behave rather as a crowd might behave, if all the men and women making it were to catch hold of each other's hands, so that they were all joined together. If they all held on to each other as tightly as they could, and especially if all the people on the outside of the crowd held each other's hands so as to make a ring, then that crowd would be something like the crowd of particles of water that make up a drop of water. They all prefer to hold on to each other, and stick together, and that is why the drop is formed at all.

THE NEXT QUESTIONS ARE ON PAGE 687.

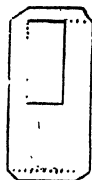
PLANS FOR THE SHOPS OF MODELTOWN



1. Corner shop for Modeltown

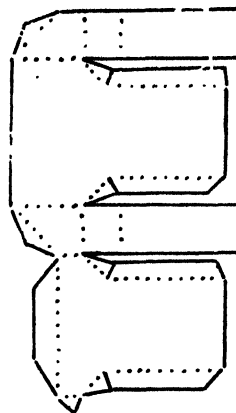
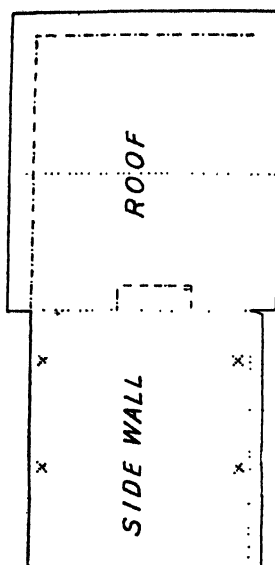


2. Plan of first-floor partition

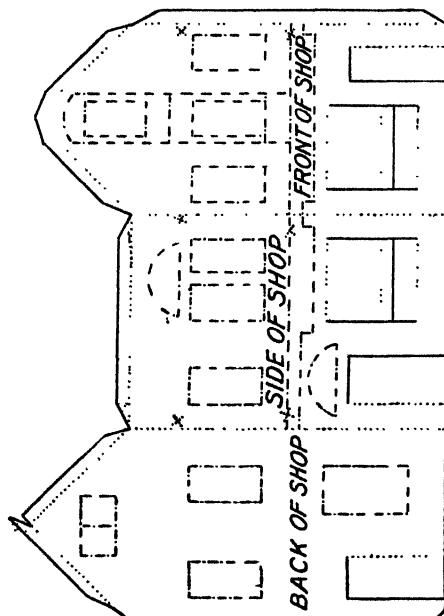


3. Plan of shop partition

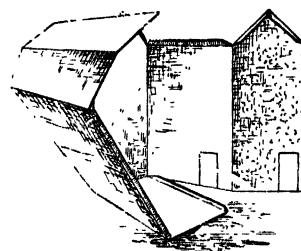
These are half-scale. Take measurements with rule B



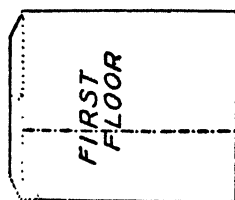
7. Plan of chimney
To be made same size



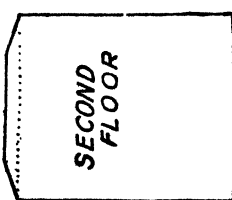
4. Plan for Modeltown shop—half-scale
Take measurements with rule B



8. Folding up the shop

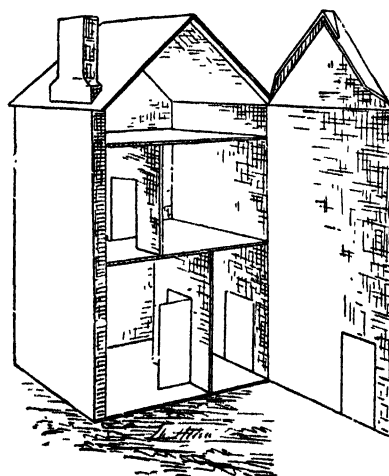


5. Plan of first floor



6. Plan of second floor

Take measurements of 5 & 6 with rule B



9. The shop with the partition walls

THINGS TO MAKE AND THINGS TO DO

WHAT THESE PAGES TEACH US

THE building of Modeltown advances a step further in these pages, where we learn how to make our first shop. We learn what to do in the garden at the end of April. In our needlework we learn to make the doll's first little garment, and we begin, also, another interesting occupation with our needle and thread and scraps of material that can easily be spared, perhaps, from mother's work-basket. This is the making of the cloth animals described on page 619. If we follow these instructions we shall soon have quite a little Zoo of our own. These animals are not only easy but very cheap to make, and they are not only a source of great amusement, but teach us one of the great lessons worth learning—how to make use of waste. Many more things we learn, also, that are both useful and entertaining, and while our games are, this time, to be played out of doors, our problems give us more interest as we sit by the fire.

CONTINUED FROM PAGE 491

MAKING SHOPS FOR MODEL TOWN

THE first sort of shop in a small town is always a grocer's shop. Have you ever thought why this is? Perhaps you have never thought about it at all. The reason is that people buy things to eat every day and sometimes several times a day. We do not buy a pair of boots or a hat very often, so that if we live away from the shops where such things are sold it does not matter much. But it would be very inconvenient if we had to go far for the sugar, tea, and flour that we need every day. That is the reason the grocer's shop is always the first shop to be opened in a village.

So that we will first make the grocer's shop. By this time we are familiar with the method of making the plans on the cardboard and of cutting out the shape and gluing the pieces together, and we need not, therefore, be told how to do every little thing as we were in the earlier lessons. We have now learned to think things out for ourselves, and to be able to see what to do from the plans and pictures without all the simple explanations.

The first picture (1) shows us what the grocer's shop will be like when it is finished. Notice that it is a corner shop, with two windows on the ground floor and with two doors. The two windows look into different streets, and that is why a corner shop is always thought to be better than a shop with two windows looking into the same street. A corner shop is always better seen than a shop with a front in only one street, and every shopkeeper, whether he is a grocer or not, wants his shop to be well seen. One of the doors in the grocer's shop front

is the shop door. The other door leads to the house above, where the grocer lives.

Having an idea of what we are going to make, let us now begin to make it. The big plan, which is marked 4, must be very carefully drawn on card twice the size of the plan in the book. This is to say, we use rule B to take our measurements with, and the full-sized rule to mark the sizes on the card.

This will need patience and care, and must be done exactly. We must remember, of course, the meaning of the three different kinds of lines in the drawing, which were explained on page 482. But one thing more must be explained.

There are a number of half circles in the plan, which may seem difficult at first, but which we can easily make the proper size in our drawing by placing a dime on the card in the proper place and drawing round it with our pencil.

There are a few places in the plan where crosses like this X are marked. Make these crosses on the model and pierce the centre of the cross with a pin or a needle. These are the places where the inside floors are to be put, as we shall see presently.

Having made the large plan, cut out the card, as we now know how to do, bending it over at the dotted lines—not at the chain lines, remember—and fold it up to make the frame of the building. It is easy to see where the edges should be glued together, so that we need not go over all these one by one. We must make the back of the shop to open, so as to enable us to put in the inside floors and walls afterwards. Picture 8 shows how the frame of the building is bent up in the



A finished shop for Modeltown

proper way, and will guide us if we have any difficulty in doing this. Now we glue to the inside walls, just above the holes we made in the centre of the crosses, some small slips of wood, such as matches without heads. When these are firmly in place, we make and cut out the cards to form the floors as shown in pictures 5 and 6, making them to double scale. Now we make and put in the two partitions shown in pictures 2 and 3, making these also to double scale. The bottom picture (9) shows where the partitions should go, and on the ground floor and the first floor in the plan is a dotted line also showing where the partitions should be placed. We finally make and cut out the chimney, the plan of which is given in picture 7, making it the same size as in the picture, and glue it into its place.

The whole building should now look like picture 9, with the floors and partitions in their places and with the back wall opening. If we have cut the doors properly we shall find that they can be opened and closed, the side at the dotted line forming the hinge. The two shop windows are cut in a peculiar way. Fold the under parts back into the shop, and these will form the two window-sills. Now bend the top parts outwards, and they will represent sunshades, protecting the things in the window from the heat of the sun.

The building is complete, and now we have only to color it to take away its cardboard appearance. On the page before this there is a picture of a little shop made from the particulars given and afterwards photographed.

The blinds were painted with red lines, the roof was painted with dark brown lines filled in with lighter brown to resemble tiles, and the windows were colored dark blue. Around the door, pillars were drawn and also colored brown, and the semicircular space above the door was made to look like a window.

Now we have made our first shop. From the same plans we may make a few more, and erect a little row of them. We must make the others without the side windows, as they will have one front only, and cannot face into two streets. This will not be difficult if we are the least bit clever.

The next thing to do, however, will not be so easy. Suppose we make a corner shop for the other end of the little street, just like the corner shop we have already made, but make it the opposite way—that is to say, with the side windows and the door at the right side instead of at the left side. This is a task that will show if we can think things out for ourselves as well as follow plans and instructions given.

We can make as many shops, of course, as we want in our little town; perhaps we might make seven altogether—one for the grocer, and one each for the butcher, the baker, the shoemaker, the dry goods merchant, and the druggist. That will be enough for a small town. But when all the smaller shops are doing a good business, very often a large store comes along and opens a much bigger shop, selling nearly all the things that all the other shops sell.

Our next task will be the erection of a larger shop than that we have just made.

A LITTLE GARDEN MONTH BY MONTH

WHAT TO DO AT THE END OF APRIL

WHERE a boy or girl has a garden that has been made and planted for some long time, there will be, besides the small plants of annuals that have come up from recent seed-sowing, some plants that live year after year. Some of these remain green all through winter, but some of them die down completely, so that nothing is seen above ground. But with the first breath of spring, and often as early as March, we see them peeping through the soil.

Among these are such favorite plants as perennial larkspurs, perennial sunflowers, Michaelmas daisies, phloxes, and bleeding heart. Where they have grown undisturbed for several seasons, it is possible they will send up too many young shoots. If the phloxes, for instance, do this, and we would rather have a few remarkably fine heads of flower than a quantity of smaller ones, we must reduce the number of these growths to five or six at the most. But if we would like to have a supply of nice young plants for autumn planting we need

not throw away the young shoots we remove. We may cut them to about 5 inches in length and plant them in the ground in some rather cool position, and these cuttings will strike root. They should be planted firmly, and a little more than half their length should be under the soil.

This rearing of plants from cuttings is very interesting, and gives us much pleasant work, as all the summer we shall have to think of them, and see that they do not suffer for want of water. It is rather late to put in the cuttings of phloxes and other perennial plants, but it is not too late if they are planted in a position that does not get the sun.

The present is a good time to plant new things in our gardens, and this should be done in the garden that has only lately been made as well as in those that are not new.

If we have no pansies, by all means let us obtain some at once, for they are as good as anything we can have for the front edge. We may plant them by themselves or in turn with other dwarf things, and this,



The periwinkle, a capital plant to grow under the shade of trees

perhaps, is to be recommended in a small plot, as it allows of more different kinds of plants being grown. We must remember, too, that pansies are charming as cut flowers if we want to fill small vases.

Among the tall plants we certainly ought to put in a few early-flowering Japanese chrysanthemums. In gardening we must always be looking ahead, and seeing to it that we provide plants due to flower many months ahead. The pansies will flower most of the summer, and these chrysanthemums will flower right away through the autumn until the sharp frosts come.

There is a right way to plant and also a wrong way. The right way is to dig a hole large enough to take all the roots and allow them to be spread out on all sides, and, having arranged the roots, then to cover the plant to what is called the collar. We can generally see how far it has been in the soil previously by the appearance of the stem, and can be guided by this. Young gardeners often plant too deeply.

If you want to have ferns in your garden, this is the time of the year to plant them.

Weeds grow apace at this season, so that it is a busy time for the hoe. But where weeds are growing close up to young plants, or the tender shoots of old ones, the hoe may become a dangerous tool, and it is far better to put it aside and take to "hand-weeding." Now comes the question: What shall we do with the uprooted weeds? Listen to what Mr. Robinson says on this matter in his book on the English flower garden: "Let us not cart them away, with the best of the surface at the same time, but bury them where they are, or place them over the roots of trees and shrubs." You see, decaying weeds help to enrich the soil.

The thinning of little seedling annuals, or other plants, must be attended to, and if a first thinning does not leave them far enough apart, then a second must be made, and if later they are still too close they must be thinned again. For small dwarf plants, 6 inches from plant to plant is sufficient, but for larger ones 9 inches or a foot, or more, will not be too far. We must not consider them in their present stage, but we must picture them fine grown-up bushy plants, branching out on all sides, and laden

with flowers, and we must leave room now for all this ample growth. Perhaps you have a few pots of geraniums and fuchsias that you have been wintering indoors, and hope to plant out in your gardens for the summer. At present it is too early to do this, but the time has come when we must prepare them for an out-of-door life and harden them. They can be stood out of doors in their pots in some

sunny place, but, if at night it seems inclined to be frosty, either they must be put under cover, or a bit of calico tied to four small posts spread like a tent above them, and removed next morning. Frost strikes straight down; and this is sufficient protection at this season unless accompanied by a keen wind. But it is always safer to take them indoors, or

to put them in a shed, as keen winds sometimes rise unexpectedly during the night.

As flowers which grow on plants that have a bulb root fade and die, you will notice that the leaves either of snowdrops or daffodils, or whatever they may be, grow very fast; they become much longer, and they grow very untidy. You want to cut off these leaves, perhaps, because you think they are no use now the flowers have faded. But by no means must you touch these leaves. Their growth at this time is of the *greatest importance*. They are storing up nourishment, which is conveyed to the bulb that it may have strength to produce its flowers next year. Thus, you see, it will never do to cut off these leaves. We

must just leave them, and before long they will die away completely. Some of these leaves are brittle; but the crocus leaves are rather tough, so that we may, if we like, tie them in a loose knot, and prevent them, in this way, from taking up so much room.

Lettuce seed may be sown. Indeed, three or four sowings at different times is recommended to keep up a good supply. The ground should have been very deeply dug before this seed is sown,

and it should be put in very thinly. Many seedling plants we can transplant if we wish to do so, but it is important to remember never to transplant young lettuce plants, for plants that are never moved will not run away to seed nearly so fast as transplanted ones. In transplanting, handle the roots carefully, and when replanted, give plenty of water.



A newly-planted corner of hardy ferns



The pansy, a useful plant for a small garden

GAMES TO BE PLAYED OUT OF DOORS

OUR games this time are to be played out of doors, and they have this great advantage—that nobody need stand still, but that all the players can take part in them at the same time.

ROUND TAG

IN this game, which is sometimes called "Tierce," "stations" or "homes" should be marked out seven or eight paces apart, but in such a way as to form one large circle. At one of these stations three players stand, one in front of the other, while at all the rest only two stand, also one in front of the other. Thus, if there are fourteen players, there will be only six stations—one occupied by three players, five by two, the remaining player taking the part of "he."

To begin the game, "he" must stand at the opposite side of the circle to that at which the three are stationed. Then he runs toward them, his object being to touch the *outside* boy. This boy at once tries to escape, but is only safe from being touched when he succeeds in placing himself in *front* of any other couple in the circle. Directly this is done, of course it makes three at that station, and the player at the back must escape in turn or he will be touched, in which case he has to be "he," and the game starts again.

I SPY

THE players divide into two parties. One party goes away and hides, the other stays "at home" with closed eyes. Presently they call out: "Coming once, coming twice, coming thrice," and if no one answers "Not ready" they begin their search. When any searcher catches a glimpse of a hider, he or she calls out: "I spy —," giving the name of the person found and the place of hiding. At the cry the one discovered leaves his place, and does his best to touch the seeker before he can get "home." Only seekers who succeed in getting safely back may go out again to look. Keen eyes and swift feet are necessary for all searchers, or they will have little chance of spying a hider and reaching "home" before he bounds out of his den. If the hiders fail to catch half the number of those who seek them they must take their turn in "home." This is a livelier game than hide and seek, though it is something like it.

TOUCH OR TAG

ONE player is counted out from the rest as "he." The others then scatter about the field, while "he" does his best to touch them. The one touched takes his place.

Sometimes "touchwood" is allowed, and that means that any player who has his or her hand against wood, such as a tree, a fence, or a gate, cannot be touched until the hand is taken off again. It is a useful part of the game when we get out of breath for a minute.

In "crosstouch" any player who runs between "he" and the person he is chasing makes that person free, and the offending

player must be chased instead. The oftener this is repeated the livelier the game will be.

FLAGS

A LONG straight line is chalked on the grass, and the party of players is divided into two equal numbers, or sides. Each side then goes into its own "country," the line stretching between them. Every player must lay down on the grass, a few yards inside his line, a handkerchief, a cap, or a scarf. These are the "flags." At a given signal one side rushes across the line to try to capture the enemy's flags. Those who succeed must be allowed to return to their country, but any caught before securing a flag are prisoners. It is then the other side's turn to cross the line, and their prisoners (if any) must help to capture the lost flags and those belonging to the enemy. No player must take more than one flag at each attack, and the side that is first to lose its flags is defeated.

FILLING THE GAP

IN this game all the players but one form a circle by holding hands, and the larger the circle is the better the fun. The player left out walks round and round the outside of the circle, and presently touches someone on the back. Directly he has done this he starts to run round the circle, while the boy he has touched does the same, only he runs in the opposite direction, thus leaving a gap, of course, where he stood. The game is to see who can reach this gap first, and the one who does so fills it. The other walks round and touches someone else, and so the game goes on.

WARNING

A LINE is drawn across the grass, and a player takes his place behind it, where he is at "home" and safe. Presently, with both hands clasped in front of him, he calls out: "Warning! Warning!" and, still with clasped hands, jumps across the line and chases the other players. If he can touch one of them, the one touched runs back to "home" with him, and they start out again together, hand in hand. The game becomes more exciting as more players are touched, for each one adds to the chain that comes out from "home" to make prisoners. But on no account must those who form this chain unclasp their hands, or they can be caught and made to release their captive.

FOLLOW MY LEADER

"MY LEADER" must be daring, or there will not be much fun in following him. The players take places one behind the other, the more the merrier. Away goes the leader through the most difficult places he can think of, jumping over ditches, climbing steep banks, and running over rough ground. If any follower fails to do the task set by the leader he must retire to the back of the row, and when the fun is over it is sometimes found that the one who started last has worked his way to the second place, and thus comes next to the leader.

HOW TO MAKE OUR OWN ZOO

A LITTLE while ago most of the creatures in our Home Zoo were lying together all in a heap at the bottom of somebody's piece-bag. They did not look much like animals then, but that was before they were touched and brought into shape by the wonderful fairies Needle and Thread. Our kitten was just a bit of black plush left over from the trimming of a cloak; our fierce lion was a corner of fawn-colored, smooth-faced cloth from a tailor-made suit; our fat pig and dear little white bunny were

pile, or "nap," goes, and take care to place the pattern so that it will stroke from the head to the tail, as in nature.

3. All the patterns are cut out in halves, so that you will have to double the material. We shall understand this better later. But be very careful to see that the two halves *face* each other, and cut out with neatness and exactness, making the pieces all fit one another precisely.

4. Stitch up as closely and neatly as you can, with the sewing-machine if possible,



Animals to make at home

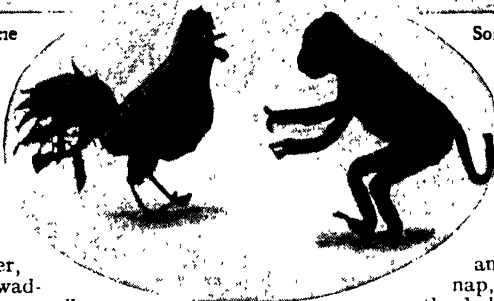
Some members of our Zoo

olds and ends of a warm swansdown calico shirt; and our curly dog was a scrap of imitation astrachan from somebody's winter jacket. But we just cut them out, and sewed them together, and fed them well on wadding, and here they are—all that you see in the picture, and many more. Making one's own Zoo is great fun. It is so nice to have the animals to play with. They will all stand up; and if their feet are glued to a small stand, with wheels—such as any boy can make—little children will be delighted to draw them about. If they are *very* nicely made they are quite pretty models, and will readily sell at a bazaar.

But, before we start to make them, there are a few things which we must always remember if we want really to succeed. If we number them it will help us to remember

1. The best materials are tightly woven stuffs that are plain on one side and fluffy or shaggy on the other. Thin and loose cloths that easily fray are troublesome. Beaver cloth, all imitation furs—if they are not too thick—swansdown calico, plush, and velveteen, all make up splendidly.

2. In cutting out, first note which way the



but remember that very firm, close seams are most important.

5. All animals have their principal seams sewn on the wrong side; but if the cloth is thick and firm, with a good nap, some parts—such as the holes where the legs are fastened in, and sometimes the legs themselves—may be sewn raw-edged on the right side, and the nap at the margin pulled over the stitches to hide them. Thinner cloth must be turned in where necessary to sew or hem over on the right side.

6. Stuff always with unbleached wadding, as filling. A yard will fill three or four animals of 7 in. or 8 in. long and 4 in. or 5 in. in height. Never use cut-up flannel or any other odds and ends if you want to get a good effect. Put the wadding in a little at a time, pushing it well home with your finger or the point of a pair of scissors, and pack as tightly as ever you can. This is important.

Now we may start on our first animal—the cat.

Grey velveteen or plush makes the prettiest cat, but black will do. The cat, when cut out, is in eleven pieces—namely, two upper halves, two under halves, two pieces, upper and under, for each of the ears, the upper



The cat made as described on this page

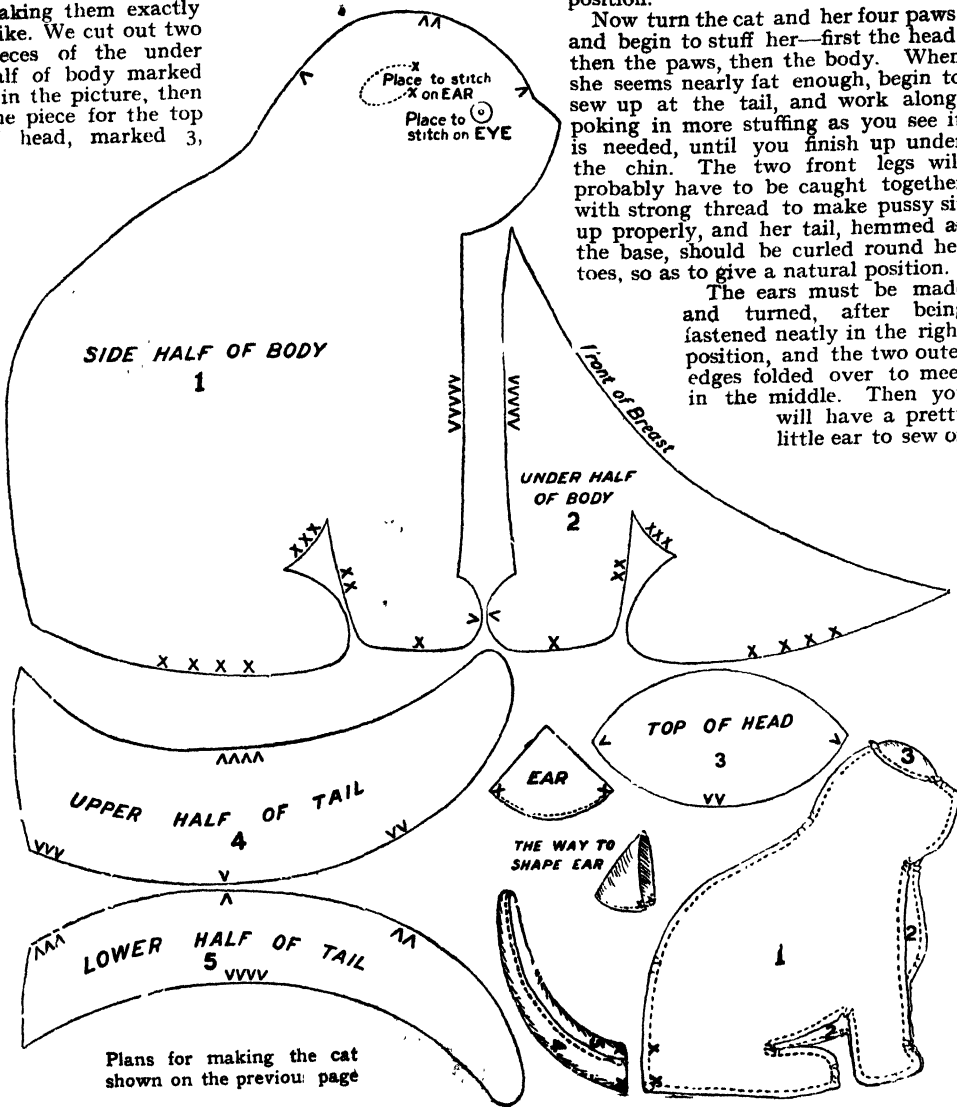
THINGS TO MAKE AND THINGS TO DO

and under halves of the tail, and a lemon-shaped piece on the top of the head. We cut out the pieces to the shapes shown in the plans, which we can trace on thin paper. Let us begin with the side half of body which is marked 1. We cut out two pieces this shape, making them exactly alike. We cut out two pieces of the under half of body marked 2 in the picture, then one piece for the top of head, marked 3,

tail, turn it, and stuff it. Stitch on the lemon-shaped piece to the top of the head in the position shown in the pattern. Sew up the upper animal, beginning at the throat and going over head and back, and ending at the tail. Be careful to keep the halves in proper position.

Now turn the cat and her four paws, and begin to stuff her—first the head, then the paws, then the body. When she seems nearly fat enough, begin to sew up at the tail, and work along, poking in more stuffing as you see it is needed, until you finish up under the chin. The two front legs will probably have to be caught together with strong thread to make pussy sit up properly, and her tail, hemmed at the base, should be curled round her toes, so as to give a natural position.

The ears must be made and turned, after being fastened neatly in the right position, and the two outer edges folded over to meet in the middle. Then you will have a pretty little ear to sew on



one tail piece marked 4, and another tail piece marked 5, and, finally, two ears to the shape given in the picture. We must remember to make every piece the size given in the pictures.

Now we are ready to sew the pieces together. The pictures are marked with V's and X's, and these show what pieces are to be sewn together. The piece marked VV is to be sewn to the other piece marked VV, and so on. We begin by stitching the under halves on to the upper ones, being careful to stitch very closely round the toes. Next stitch up the

in position. Beads or sequins make bright eyes; but, if the cat is to be a toy for a young baby, black worsted eyes, just stitched, are safer. A nose and mouth may be also marked in worsted, as here shown, and bunches of white thread can be sewn on for eyebrows and whiskers. If you finish up by marking the "tabby" pattern in ink, copying from a real cat, and brush the stiffness out when dry, you will find you have made a very charming cat.

The next animals we shall learn to make for our Zoo will be a lion and a tiger.

WHAT TO DO WITH A GIRL'S WORK-BASKET

2. THE DOLL'S FIRST LITTLE GARMENT

WE have learned how to do the different stitches that are needed to make dolls' clothes, so now we should be able to undertake the fine stitching for the garments that we are going to make.

We will start with the little chemise. If you look at the picture (1) you will see that the pattern is quite simple, and very easy to cut out if you read this article carefully.

Draw the pattern to fit the size of your doll on a piece of paper, and mark it A, B, C, D, E, F, like the sketch. Then take a piece of fine, soft calico, or, better still, nainsook, twice the length and twice the width that you want the little chemise to be, allowing enough over for seams and hem. Now fold the material in half, and then fold it in half again. When you have done this the shape of the material should be as it was before, only smaller. You have now in your hand four folds of material, which are longer than they are broad.

Before going any further we should be sure that the two single folds of material are at the top, and the double fold at the side, for this is important, as we shall see. If this is not quite clear to you, look at picture 2, which shows the material folded. Lay this down on the table in the position shown in the picture, and lay the pattern on it. Pin the pattern to the material before it can slip out of place, put one pin at the top, another at each side, and one at the bottom; then take a pair of scissors and cut all round the outlines of the pattern, except the parts between B and C (this is the shoulders), and between A and D (this is the middle of the chemise, as you will see when you open the material out after it has been cut).

When you are cutting, you must remember to leave half an inch for the double seam under each arm, and an inch and a quarter for the hem at the bottom.

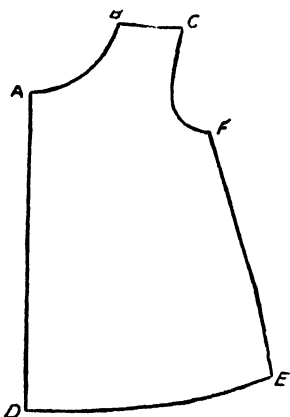
Take off the pattern and unfold the material. The two sides of the little garment are now shaped and held together by the uncut folds of the shoulder. If you look at your own little chemise you will find that the front of the neck is cut lower than the back, but in the doll's pattern both back and front are alike, are they not? Now turn to the picture (2) again, and you will see that there is a dotted line below the one between A and B. The line between A and B represents half the back or the neck, and the dotted line half the front. So to get the front, take your scissors and cut out the material a little, being careful to slope out more at the centre than at the sides. Then slope out each little

sleeve (between C and F) in the same way. Just now we spoke of half the pattern. Nearly all patterns are cut out in halves — that means that nearly all garments have, of course, two sides, or two parts, which are exactly alike, and it is far easier to get these exact if we double the material, lay the pattern on it, and cut them both at once. This is why we always, or nearly always, speak of a pattern as being *half the back or half the front*, and so on.

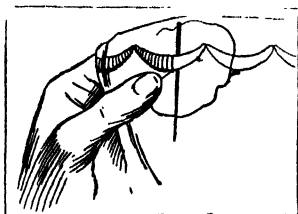
Now these points are quite clear we must begin to sew our chemise together. Before starting the sewing we must be sure that our hands are spotlessly clean, for on its neatness and cleanliness depends the success of our work. To look well, needlework must be kept quite fresh, or its charm will be gone, however neat the work may be.

Thread a short needle and begin with the seams on each side, joining them either by running and felling them, or by a French seam. If we have forgotten how to do this, we must turn to page 489 of our book.

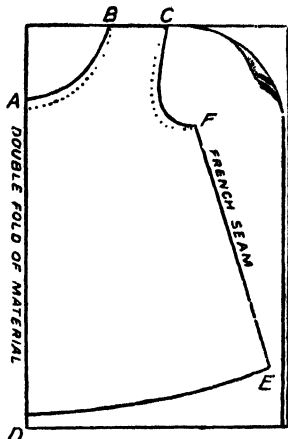
The next thing to do is the hem at the bottom. Turn up the material about $1\frac{1}{4}$ in. You will remember that we allowed an inch



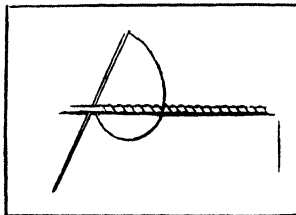
1. How to cut out the pattern



3. Buttonhole scallops



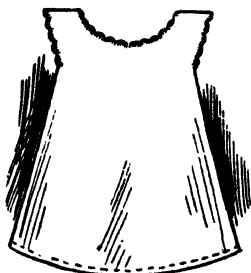
2. Laying pattern on the material



4. The whipping stitch

and a quarter when we cut the material. The quarter of an inch is for the first little fold, and the inch will be the width of the hem. Measure an inch and a quarter all round, turn this down and tack it to keep it in place. A good way to measure the hem and to be certain that it is quite even is to get a piece of stiff paper—or a visiting card is better—measure an inch on it, snip it with the scissors to mark it, and use it as you would use a tape measure. When your hem is even, fold the rough edge under a quarter of an inch, and tack it again, and then hem it round with tiny, neat little stitches.

Now what are we going to do with the top and the sleeves? If we have been practising all the stitches which we learned the other day, we shall be able to do some small buttonhole scallops round the neck and sleeves, in which case we shall have the daintiest little ornament that one could wish for. If you look at picture 3 you will see how the material is cut out in large scallops all round for the buttonhole stitches to be worked on. The picture shows how the stitches should be narrow at the top of each scallop, and get wider in the middle.



5. The finished garment

If you cannot get this quite even, draw a faint line, like you will see in the picture, and work over it.

But if this is too difficult we can make a little hem and sew on the end of it a piece of pretty Valenciennes lace. As the neck is round, and not straight, it will not be very easy to fold the hem in the usual way; but if you try to roll the edges and make only a tiny hem, you will find it will not be nearly so difficult.

Now for the lace. This should be first gathered in a way that is called "whipping"—that is, we turn the edge in a little and make little over-and-over stitches like we can see in picture 4, and then pull it up, so that it makes a little frill. When the lace is pulled up full enough—do not let it be too full—sew it on to the edge of the hem with tiny stitches, just as you "whipped" the lace. In sewing the lace to the chemise, do not put the two back to back and then sew, but draw them together as you would sew together the two edges of a hole in a glove. This is the only way to get the lace to set quite flat.

And now your little chemise should look just like the one shown in picture 5.

ARRANGING FLOWERS FOR THE HOUSE

THE world has paid every woman a charming compliment. It has credited all of us with the ability to make our surroundings beautiful. Have you not read in many books that the heroine possessed a magic touch? When she had been there the room seemed to show an extra daintiness, the place wore an added charm, an air of comfort and cosiness that it did not possess before. But, unfortunately, the novel gave no precise direction as to how she did it.

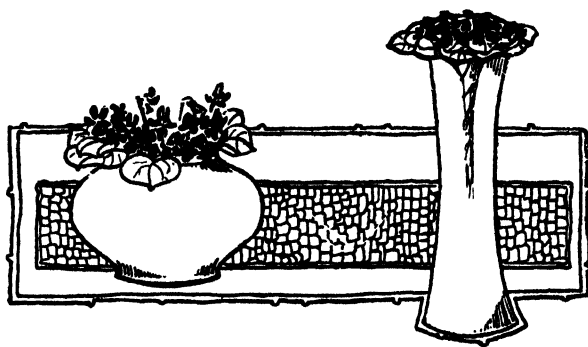
These things are not arrived at by instinct. The good fairy who deals out the birth-gifts is not so lavish as we are led to suppose, and seldom gives to anyone so big a gift that there is nothing left to learn. She just gives a little bit—just enough to show it is there—and one has to learn the rest.

We shall not be able to learn here everything that our favorite heroines are supposed to know, but only a few things about one simple part of the subject—how to arrange flowers.

I wonder if you have ever thought that the size, shape and color of the vase is a most

important point? For instance, daffodils, which are heavy flowers, should always stand in strong china—for preference, green glazed ware. There is something so strong and sturdy about their growth that they need a good support and plenty of water; so don't put them into frail china vases that will topple over with a breath of wind because they are top heavy.

Also remember how the daffodil grows. How many leaves go to one daffodil? Hundreds! Well, you cannot get hundreds into a vase, but you can get a good many, and you will find the flowers look far finer with a plentiful supply of leaves, because—and this point applies to every



This shows the right and wrong way to arrange violets and similar flowers. They should be loosely arranged in a low vase, and not cramped up in a high vase where they can hardly be seen.

kind of blossom—they grow like that.

Suppose you had a lovely jarful of white lilies, but no leaves, you would not think of putting in some thistles, would you? And yet many people who try to arrange flowers do things that are just as absurd and wrong as this. Be careful how you mix blooms; be quite sure they go well together, or it is much better to put them in separate jars. It does not always happen that all

varieties of one kind of flower look well together. Two geraniums, one a vivid scarlet and the other a magenta pink, would give a terrible effect if they were put in one vase. After all, most flowers do look best by themselves—although one often has to make use of those one has.

It is a good rule to keep to one color and white, or only to use several shades of one color. In each case have plenty of green. Also remember that the green leaf of the plant itself always suits the blossom best, so that if you cannot get that, use some other leaf as much like it as possible in color and size.

Another important point to remember is the position of the flowers. Some flowers were made to look down upon, while others are more charming when one has to look up at them. So, when placing them, try to think which is the better position.

If you have an azalea plant in bloom don't put it on a high table, but stand it on something very low or on the floor, so that you can see down on to the lovely masses of flower, and not only get a view of the stalks and backs. Flowers like bluebells which droop their heads will look better up high, say, on the mantelpiece, because then one can see the beauty they seem to be shyly hiding.

Don't despise wild flowers. They can be made to look lovely in the house. Select the best blossoms and keep one kind together, and have them always in big bunches. Buttercups, with a few strands of green wild oats rising above them, look

beautiful in a big low jar. But they should be stood in the sun, for half their charm lies in the glossy shine on their petals, and this is best seen when the sun is on them.

Some people gather a few buttercups, put them in a tall, thin vase, and stand them in a dark corner, and then they wonder why they look so dreary. It is only because they went the wrong way to work, and did not think.

Have you noticed how very beautiful some of the seed-pods are? Use some occasionally among your blossoms. Nasturtiums, sweet peas, and roses have the right sort for decoration. They give a variety and uncommonness to quite an ordinary bunch, and in the autumn they can often be made into a decoration by themselves. Think how charming a large bunch of red rose-berries can be, and honesty, you know, is a seed-pod too.

Now we come to the question of bowls. Big bowls of flowers have a charm which a mere vase can never possess. Think how often our artists put a bowl of flowers in a picture! Not everyone can manage to get the blooms to stand up properly: they have an annoying trick of falling to the edge and leaving a hole in the middle. This will not

happen if you put a little jam-jar in the centre of the bowl first, and then fill both with water; but be sure your jar is not higher than the bowl, or it will show.

Remember that no woman who is really refined allows ugliness near her. These little things take such a short time to do, and really give a great deal of pleasure.



Marguerites, carelessly arranged in a wide bowl.



This is the same bowl, with a jam-jar inside it, hidden by the flowers, which holds the stems together and gives a prettier effect.

THE EASIEST WAY TO MULTIPLY BY NINETY-NINE

SOME of the numbers in the multiplication table are easy and some are difficult. Perhaps you think that the figure 9 should not have been in it at all. But there is a very easy way of multiplying by 9.

Suppose that you want to multiply 34,875,695 by 9. Well, the easy way is to put 0 after it and then put the same figures 348,756,950 below, without 0 added, and do 34,875,695 it as a subtraction sum. This is how it is done:

When we add 0 to a number we really multiply the number by 10. The number 9 is, of course, one less than 10, so that when

we multiply by 10 and then subtract the number itself once we are really multiplying by 9. This way saves more time if we are multiplying by 99, or 999, or 987,654,300 any number of nines. Suppose 9,876,543 we have to multiply 9,876,543

by 99, this is how we do it: 977,777,757 We simply add 00, which is the same as multiplying by 100, and then take away the number once. In multiplying by three nines (999) in this way we add three noughts (000), and so on with any number of nines, always subtracting the original number once after adding the noughts.

LITTLE PROBLEMS FOR CLEVER PEOPLE

THESE problems are continued from page 491, and the answers to the problems on that page are given below.

HOW LONG WAS THE TRAIN?

30. As I was waiting at the station, a train took 9 seconds to pass me; and to go through the station, which is 88 yards long, it took 21 seconds. How long was the train?

HOW OLD IS TOMMY?

31. In another three years Tommy will be three times as old as he was three years ago. How old is he now?

HOW FAST IS THE CURRENT?

32. Duncan rowed three-quarters of a mile up-stream in half an hour. If there had been no current he would have taken only a quarter of an hour. What is the speed of the current?

WHAT WERE THE DISTANCES?

33. A farmer drove to Chester at 8 miles an hour, and returned home by a road 2 miles longer at 10 miles an hour. He found that the return journey took 12 minutes less than the outward journey. How long was each road?

WHAT WERE THE COINS?

34. A man asked his friend for change for a half-sovereign. The latter replied: "I have five pounds in silver, but I cannot do it." Explain how this could be.

HOW MANY MEN WERE LOST?

35. Nine men, lost in the mountains, had food for five days. Next day they met other lost men without food, and it was found that the food divided among the entire company would last for three days only. How many lost men were in the second party?

THE ANSWERS TO THE PROBLEMS ON PAGE 491

19. By 8.30 Alfred has walked one-fourth of the way, and in another 5 minutes he has walked one-third of the way. The difference between one-third and one-fourth is one-twelfth, so that he walks one-twelfth of the distance in 5 minutes. At 8.30 he still has three-fourths, or nine-twelfths, of the distance to go, and this will take him 9 times 5 minutes, or three-fourths of an hour. He therefore arrives at school at 9.15.

20. From noon on Monday to 8 o'clock on Wednesday morning is 44 hours. His father's watch, therefore, lost 3 minutes in 44 hours. But it was right when it had lost only 2 minutes, which it would do in two-thirds of 44 hours—that is, in 29 hours 20 minutes. This number of hours from noon on Monday would make it 5.20 on Tuesday afternoon.

21. Try one carryall first. This will seat 9, and leave 50. There is not an exact number of 4's in 50, so that they could not be seated in cabs. Next try 2 carryalls. These will seat 18, and leave 41, which, again, cannot be seated in cabs. Next, 3 carryalls will seat 27, and leave 32. Now, 8 cabs will seat exactly 32, so that the manager must have sent 3 carryalls and 8 cabs.

22. The hare makes 3 leaps while the hound makes 2, so that she makes 9 while the hound makes 6. But the hound goes as far in these 6 leaps as the hare does in 14, so that the hare loses a distance equal to 5 of her own leaps in every 6 leaps the hound takes. She will therefore lose 60 leaps while the hound takes 72—that is, the hound catches her when he has made 72 leaps.

23. The customer received 3 cocoa-nuts (worth 24c.), 15 oranges (worth 15c.), and 2 apples (worth 1c.), making 20 in all for 40 cents.

24. This is what is usually known as a "catch"; and the answer is that, as they stood, they faced each other, one looking north and the other south.

25. One-third of the seats were filled at 50c. each. At 25c. each two-thirds would have yielded the same amount. Therefore, had

the hall been filled, the remaining third would have yielded \$50, so that there were 200 in that third, or 600 seats in the hall altogether.

26. If the grocer had put in 1 oz. of chicory and 15 oz. of coffee, the price would have been 30½c., that is 30c. for the coffee and ½c. for the chicory. Thus every ounce of chicory in the pound of the mixture lowered the price 1½c. below 32c. 23c. is 9c. less than 32c. and there are 6 times 1½c. in 9c. Thus there were 6 oz. of chicory in the pound of the mixture, and there must have been 10 oz. of coffee.

27. If we divide 60 minutes by the number of trains an hour, we get the number of minutes between each train. If there were 3 more trains per hour, there would be 1 minute less between each train. We therefore have to find two numbers whose difference is 3, and which, when divided into 60, give results which differ by 1. The numbers which divide 60 are 2, 3, 4, 5, 6, 10, 12, 15, 20, 30. First, those which differ by 3 are 2, 5; 3, 6; and 12, 15. Of these, the pair which gives results differing by 1 when divided into 60 is 12, 15. Hence there were 12 trains an hour, which is a train every 5 minutes. The passenger waited 4 minutes.

28. If there are more words than 12 in a telegram, the cost is ½d. a word, so that it one contained three times as many words as the other it would cost three times as much. It is clear, then, that the first telegram did not have more than 12 words. Therefore it cost 6d. The second must have cost 1s., and would contain 24 words. Thus the telegram of the day before had 8 words.

29. Fred and Albert crossed the ferry first, and Fred brought back the boat. Then the father crossed alone, and Albert returned with the boat. The boys again crossed together; and Fred brought back the boat in which the postman crossed alone. Albert then rowed across to the starting shore, and brought back his brother.

THE NEXT THINGS TO MAKE AND TO DO BEGIN ON PAGE 727.

The Book of NATURE

WHAT THIS STORY TELLS US

WE read in these pages of the animals that are nearest in likeness to ourselves. Once upon a time there were no monkeys, but lemurs. Just as different races of men have descended from one great family, so huge apes and many sorts of monkeys have descended from the lemurs. Some have become animals like squirrels; others have grown into great creatures so like human beings that they are called man-like apes. The apes have brains like those of a tiny child, but they are more below the savage in brain power than the savage is below you. The apes are made in body as we are made; they have great strength and courage; they make rough homes of branches and leaves, but there the likeness ends. The gorilla, the orang-utan, and the chimpanzee, with their power and ferocity, the gibbon, with its strong voice and wonderful leaping powers, are described in these pages, where we read also of the many kinds of monkeys.

THE ANIMALS MOST LIKE MEN

GORILLA	ORANG	MANDRILL	COAITA	LEMUR	LORIS
CHIMPANZEE	GIBBON	BABOON	HOWLER	MARMOSSET	AYE-AYE

WHAT animal in all the world would you most like to see? You can see lions and tigers and all manner of fierce beasts alive at the Zoo. But there is something you never have seen, something which it is almost certain you never will see. That is a full-grown, live gorilla. You will probably never see in America a full-sized gorilla or an old chimpanzee, or an old orang-utan. They are too big and strong and fierce to be caught.

We may call the great apes man's savage likeness, because they are more like men than any other animals are. They have no tails. They have hands like our hands. They have the same number of teeth that we have, though theirs are much larger than ours. Their bones are like ours; their brains are like ours, only smaller and not so well developed.

Yet, for all this likeness to ourselves, they are very terrible-looking. They look terrible because, while we cannot help seeing that in many ways they are like ourselves, they are dreadfully ugly. The orang-utan looks like a hideous old man. If the gorilla were not covered with thick hair he would look like an ugly negro, for his skin is quite black, like that of the negroes of Africa, in the forests of which the gorilla lives. The orang-utan is a reddish-brown.

CONTINUED FROM 514



These apes have brains not so good as those of the lowest savages, the wild men of Australia, and those savages who lived in Tasmania until the middle of last century. The savages can make tools and throw things. The apes use stones to crack nuts, and when they are chased by hunters they break off the branches of trees and throw them at their enemies.

The biggest of them all is the gorilla, which lives in the forests of West Africa. The biggest are as tall as a tall man. Like all the man-apes, the gorilla is what we call four-handed. Its proper hands are just like ours, but its feet are hands as well as feet. Its toes are like fingers, but the great toe, instead of being close up to the rest as ours is, stands off like our thumb and acts like a thumb. Thus it can not only walk on its foot; it can hold things with it as well, and clasp the branches of the trees along which it is climbing. Its arms are very long, so that its hands reach below the knees. This is, of course, longer than our arms, but then the gorilla's legs are shorter than ours.

These long arms are necessary for the gorilla's way of living. When it wishes to walk or run upon the earth, it cannot go far in an upright position without touching the ground with its hands. It trots along like a baby

toddling, but keeps touching the ground with its hands, doubling up the fingers and pressing upon its knuckles. But that is not the most important way in which its long arm serves it. No matter how quickly it may be traveling through the trees—for that is where it chiefly goes—it has to be very careful about finding branches strong enough to bear it. So while it holds on to one bough with its feet, it reaches out with its great long arms and tests other branches to see if they are strong.

A N ANIMAL LIKE A HEINOUS OLD MAN, STANDING ON GUARD

It is a heavy creature, and if it fell it would hurt itself badly. The gorilla makes its resting-place about twenty feet from the ground, not at the top of the tree, because the higher it goes the more the wind catches it. Lower down, of course, it is sheltered and warmer.

All sorts of stories have been told about the gorilla carrying off people and making them work as slaves, but those stories are false. The gorilla, though it is one of the strongest beasts in the world, never attacks a man unless it is itself in danger. Then it is a terrible foe indeed. Its first thought is for the safety of the mother gorilla and the baby gorillas. While these escape from danger the big gorilla stands on guard, beating its chest till it sounds like a drum. Then, when its family has got away, if the enemy does not retire, the gorilla often rushes at him, and unless it be at once shot it will kill the man, no matter how strong he is, or, at any rate, leave him hurt for life.

Once a man fired at a gorilla which had come close up to him. He missed his aim, and the gorilla, seizing his gun with its hands, put the barrel between its great teeth and bit it till it bent like tin. Then it seized the man and bit his hand off.

THE GREAT STRENGTH OF THE GORILLA AND CHIMPANZEE

No wonder that we have never seen a big gorilla alive in captivity. With its powerful arms, its mighty teeth, and its savage nature, it is impossible to capture a big one alive. Little ones have been caught, but they have always died. They are better where they are, in the great gloomy forests. There they never do harm to man or beast if they are left alone. Once, by caring for it like a

baby, they kept one alive in the New York Zoo for almost a year.

We have had young chimpanzees alive at the Zoo, but never long enough for them to grow into great, strong creatures such as live in the forests. Big ones have seldom been caught, for they, like the gorillas, are very fierce if attacked. They are not quite so terrible as the gorillas, because they are not so big. The largest, when fully grown, are only four feet high, but as they have huge teeth and very strong arms they are too powerful to be captured. Not being so fierce as the gorillas, they always run away if possible when attacked; it is only when they cannot get away that they fight. They live in the same part of Africa as the gorilla, but cover a wider area, and they are great thieves. They steal the natives' crops of fruit and vegetables, and it is this which causes the black man to kill them.

A CHIMPANZEE THAT BEHAVED LIKE A CHILD

When caught young they can be tamed, and then they make amusing and interesting companions. Dr. Livingstone, the great missionary and traveler, had one given to him as a pet. It became very fond of him, and used to beg to be taken for walks with him. It would hold out its hand to him if he were going out, and if he did not take it it would cry like a child. When he was not going out, it would get leaves and sticks and grass and make itself a nest and cover itself over, just as it had been used to do when wild. If a native or a dog came near it would run to Dr. Livingstone, put its back against his legs, and then make ready to fight, just like a boy.

Have you ever known a jealous child? A chimpanzee, when it gets fond of a man, becomes jealous of anybody else for whom he has a liking, and it will do far worse things than any jealous child will think of doing. Once Sir Harry Johnston was coming home to England from Africa with a chimpanzee on the ship. Everybody was very fond of it, and made such a pet of it that it used to sit at table and have its meals with the rest of the passengers.

All went well until the ship stopped at a port where a lady and gentleman came on board, bringing their baby with

THE APES LIKE MEN AND THE AFRICAN BABOONS



The biggest man-like ape is the gorilla, which lives in the forests of West Africa. This picture shows a baby gorilla. The largest stand about six feet high.



The chimpanzee is not so terrible as the gorilla, because it is smaller. Several young chimpanzees live in the Zoo, and this picture shows one of them.



The orang-utan lives in Borneo and Sumatra, and can travel at great speed along the tops of trees, but when it is on the ground it is slow and awkward. It builds a rough nest in the trees, and when the weather is cold covers itself over with leaves.



The gibbon is the smallest man-like ape, and is the only one that habitually walks upright. Its arms are so long that it can touch its ankles when walking.



The baboons live thickly in parts of Africa, and come down at night to rob the natives' fields and gardens of corn and fruit. They go hunting in troops.



The mandrill is the strangest looking of all the baboon family. Instead of being brown or black or grey, it is violet, blue, purple, and scarlet.

them. The people on the ship all fell in love with the baby, and the poor chimpanzee felt himself forgotten and neglected. It became very sullen and unhappy. One day the chimpanzee was missing from his place at the dinner-table. Sir Harry Johnston went up on deck and there saw the wicked chimpanzee about to throw the baby overboard. The animal had found its little rival sleeping in its cot, and, thinking that if the child were thrown into the sea there would be no more rivalry, was in the act of ending the poor baby's life when its master caught it. As soon as it heard Sir Harry Johnston coming, it put the baby down on the deck and ran away.

HOW A MOTHER CHIMPANZEE PROTECTED HER BABE FROM THE HUNTER

In its wild state the chimpanzee loves to range among the trees as the gorilla does, but it goes about on the ground a good deal. It is not such a solitary creature as the gorilla. Large numbers of chimpanzees are sometimes to be met together. They show great love for their babies. Once a mother chimpanzee sat with her little one watching a hunter. She did not know what a gun was. But when she saw him raise one to his shoulder and point it at her she seemed to know that he meant to do her harm. So the poor creature covered her baby as well as she could with one hand, and with the other she made signs to the man to go away, just as a woman would if her little one were threatened.

Another one, when shot, put its hand to its side, then, when it felt the blood gushing between its fingers, it held out its hand to the man who had shot it, with a most pitiful look, as much as to say, "See what you have done, cruel man." The man who had fired the shot said that he felt as if he had committed a murder, and never again did such a thing.

THE ORANG-UTAN, THAT SKIPS ALONG THE TOPS OF TREES

The orang-utan is somewhat like the chimpanzees and the gorillas, but it does not live in Africa. Its home is in Borneo and Sumatra. It can travel with great speed along the tops of trees, but when it is on the ground it is slow and awkward. It rarely walks in an upright position, and has to keep touching the

ground with its knuckles. It is the slowest of the apes when on the ground. It cannot put the sole of its foot flat upon the ground as we can, but walks upon the outer edge of the foot. This makes it look very shaky, and like a baby or an old man.

It builds a rough sort of nest for itself in the trees, and when the weather is cold or damp covers itself over with leaves. It eats figs and the leaves and blossoms of various trees. Generally it can get enough to drink by sucking the dew from leaves, but if the weather is dry it has to go in search of water.

Strange as all this sounds, the orang-utan, when caught young, becomes very good friends with human beings. Some years ago there was one at the Zoo, which was very fond of its keeper. Some of our friends went one Christmas morning to see it. The keeper let it out of its cage in a big house. It did all sorts of pretty tricks to please him. It really tried to talk.

When it had been playing for some time, the orang wanted to have a look out of the window. She crept quietly along, hoping that her keeper would not mind. He called to her, "You come here this minute!" She looked at him, but wanted to have another peep out of the window. "Now I'm cross with you," he said, and he pretended to be angry. The poor animal was in great distress. She leapt down from the window, she rushed up to him, she put her great arms round his neck, and kept kissing him till he forgave her.

THE GIBBON, WHICH LEAPS LIKE A HUGE BIRD THROUGH THE FOREST

There is another of the man-ape family of which we have not yet spoken. This is the gibbon. The largest of these is a little over three feet high, but it does not look big, for its body is slim, and its long arms, by the aid of which it can touch its ankles when walking, make it look shorter. It is the only ape that habitually walks upright. To do this it balances itself by waving its arms aloft. Gibbons are seen at their best when in the trees, for they are the finest climbers in the world. They might be made of rubber, so wonderfully do they leap from tree to tree. Some of their leaps measure as much as forty feet.

Fancy for a moment that you are looking at one. It hangs by one hand

SOME MEMBERS OF THE GREAT MONKEY FAMILY



The proboscis monkey is one of the queerest looking and ugliest of all the monkey tribe. It has a long nose almost like a tiny elephant's trunk.



The Barbary ape scampers about on the Rock of Gibraltar. These apes climb splendidly, and are the only monkeys that now live in Europe.



The coaita, or red-faced spider monkey, has a beautiful tail, which, when not used for climbing, is carried over the back with a curl at the end.



The Indian monkeys ought to be the happiest of all their tribe, for they are regarded as sacred. They have beautiful groves and temples in which to live, but they go into the cities and villages, and shops and bazaars and houses team with them. No one is allowed to kill one of these troublesome monkeys. The Photographs in these pages are by Lewis Medland Gambler Bolton, the Autotype Co. Chas. Reid, W. Dando, and A. Rudland.

from the branch of a tree. Suddenly, without any sign of effort such as even a bird would make, it darts away through the air to a distant branch. It catches this with its other hand, then, without resting for an instant, leaps straight on to another branch, and away again without stopping to rest or gather strength. It can go on like this for hours. Sometimes as its hand clasps a bough to which it has sprung the gibbon will spin itself right round the branch, then be off again to another, so quickly that the eye can hardly follow it. It looks like a huge bird flying through the forest.

SOMETHING THAT NO ANIMAL BUT A GIBBON COULD DO

This is what a gibbon once did: It was resting when it saw a bird flying. The gibbon took a spring, caught the bird with one hand, went sailing on through the air, and with its free hand caught the bough at which it had aimed.

Another, which was tame and in a great cage, like a room, suddenly swung itself full at a window. Everybody thought that it would crash through the glass. But no; the wonderful creature caught the thin wood between the panes of glass, and, almost with the same movement, sprang back again to its first place. This requires great strength and skill. Nothing else in the world could do it.

Although it will bite if angry, the gibbon can be tamed, but you would not want to keep one long if it took to calling as it does in the woods. It has such a piercing voice that its cries can be heard for miles.

A GIBBON THAT USED TO STEAL HIS MASTER'S SOAP

Gibbons love their babies, and may be seen to take them down and wash their funny little faces in a stream. One which was tame loved to play tricks on its master. It would steal his soap if he were not looking. One day its master was writing and pretending not to see; but he did see Master Gibbon quietly take the soap and steal off across the room with it. Then he spoke, quietly, and not in a temper. The gibbon looked quite ashamed. It went softly back across the room and put down the soap in the place from which it had taken it.

Now we pass to the monkeys, of which there are many sorts. They are divided into two great families: those which live in America and those which do not. These others we call the Old World monkeys. You can always tell the difference at a glance. The American monkeys have their nostrils set wide apart; the Old World monkeys have their nostrils close together.

There is a very ugly monkey in Borneo called the proboscis monkey. You know that proboscis means a trunk or snout, and this one is called the proboscis monkey because it has a nose like a tiny trunk. But even that has the nostrils close together. The American monkeys have two more teeth than the monkeys of Africa and Asia, and two more teeth than human beings. There is another difference, too. The American monkey can use its tail as a help in climbing, as if it were an extra hand or foot; the Old World monkeys have never learnt to do that.

THE LIVELY MONKEYS THAT LIVE IN AMERICA AND INDIA

Of the American monkeys the best known are the coaita and the howlers. The coaita has a small, slim body, but a beautiful tail, which, when not in use for climbing, is carried arched over the back with a curl at the end. This monkey should be better able to walk than the man-like apes, but it cannot. If it wants to toddle a few steps on the ground, it has to swing its tail about to balance itself. The howler is a savage-looking little fellow, but his howl is worse than his bite. That is dreadful, and is kept up all night long.

The Indian monkeys ought to be the happiest of all their tribe, for in India they are regarded as sacred animals. They have beautiful groves and gardens and temples in which to live, but they go into the cities and villages; and shops and bazaars and houses teem with them. Woe to the man who dares to kill one of the people's pets. It really is not nice to have them swarming everywhere, running over food which people eat. Still, if they are properly treated they can be great pets. Here is a story to show you how clever and amusing they are.

THE ANIMALS MOST LIKE MEN

A gentleman in India was going for a holiday, so he asked a friend to take care of his pet monkey. "She is very good and very clever," he said, "and she looks after four little baby dogs for me." Well, the friend took the monkey and the puppies, and they were all very well behaved. The monkey looked so carefully after the puppies, and they were so good, that it might have been a real nurse with little children. The gentleman was delighted, and he gave the monkey a large handful of nuts.

That meant trouble for the monkey. If she sat down and ate her nuts, both her little hands would be engaged, so the puppies would stray away from her. She could not bear the thought of that. She wrinkled up her little face as she wondered what she was to do, for she badly wanted to eat the nuts, and at the same time she wanted to guard the baby dogs. At last she knew what to do.

She took a puppy and laid it down with its head towards the door and with its tail pointing towards the middle of the room. The next puppy she placed with its head towards the window and its tail towards the middle of the room. The third puppy was laid with its head towards the wall, and its tail touching the other two; and the fourth puppy was set with its head towards the fireplace and its tail touching the tips of the other three tails. So the four little doggies lay like this +, heads all pointing outwards, tails all pointing inwards. Then

the monkey sat down in the middle, on the ends of all four tails, and so, without hurting them, was able to keep the babies near her while she cracked and ate her nuts.

Smaller than the man-apes, but bigger than the monkeys, are the baboons. Their home is in Africa, and they live

in hilly parts, whence they come down at night and rob the natives' gardens and fields of corn and fruit. They are not at all nice things. They have great mouths with terrible teeth. They have snouts like pigs. Some of them have silly-looking tails which seem to be rooted far up the back, and curl over and down like a teapot handle. They hunt in great troops, and few animals dare attack them. There is one which has a tail like a pig, but the strangest of all has only a stump for a tail. This is called a mandrill, and is, indeed, a strange animal. Instead of being simply brown or black or grey, it has the brightest colors, violet and blue and purple and scarlet. The end of its snout is scarlet; then in deep grooves along the sides of its face you have purple and blue and scarlet, while the hind quarters are violet. It is a nasty-looking beast.

It is hard to be fond of a baboon, it is so ugly and fierce. Still, if you catch one young it will become very tame and friendly.

There was one at the Dublin Zoo, which was very fond of the chief man there, a gentleman named Dr. Ball. Whenever he passed Dr. Ball would go



The aye-aye is a strange animal. One of its fingers, instead of being like the rest, is thin and long like a bird's claw. It uses this for tapping the bark to see if there are any grubs hidden in it.



The marmoset from S. America is the smallest of all the monkey family, and is easily tamed.



The loris is a slim little creature, with big eyes and a pointed nose. It seeks its food at night.



The lemur belongs to the monkey family, and is believed to be the father of all the apes and monkeys. It now lives in the island of Madagascar. It has a head like a fox but hands like a monkey.

and have a word with the baboon and give it a friendly pat on the head. But one day, when he was showing a great man round, he forgot the baboon. The baboon was deeply vexed at this, and when his friend next went to see him it would not go near him. It did not forget, and for long after that it would not have anything to do with him. If a monkey sulks or is miserable it does not live long. So it was with this one. It became very ill.

The day came when it could no longer run about. Dr. Ball went to see it. The baboon dragged itself to the front of its cage, and put out its hand to its old friend. Then the poor thing lay down and died.

THE BARBARY APE, THAT CLIMBS THE ROCKS AT GIBRALTAR

There is another monkey which we ought to remember, the Barbary ape. This is the animal which you read of as scampering about the rocks at Gibraltar. These creatures belong to a family of monkeys like those which used to live in England. Their cunning is so great that a man can very seldom get near them.

Perhaps you have seen a tame marmoset, for they are easily tamed and petted. If you have ever seen one, you would scarcely think it to be a monkey, would you? You would take it for a kind of squirrel as you see it darting about its cage, or frisking in the trees of its native forest in South America. If it surprises you to hear that the marmoset, with its curious ways and its bird-like whistle, is a monkey, you will be, perhaps, even more surprised to hear that the lemur is a kind of monkey.

THE LEMUR, THE FATHER OF ALL THE APES AND MONKEYS

Not only does the lemur belong to the monkey family; it is believed to be the father of all the apes and monkeys. Ages and ages ago land stretched out in many directions where the ocean now flows. The lemur is supposed to have been the first of the monkey family, and to have wandered from North America, where it first appeared, into Europe and Africa. When the sea washed away great parts of the land, it left new continents and new islands, so everything that could not fly was shut up where it was.

The lemur tribe, which had scattered to many parts, changed and changed and changed in the course of time. In America it grew into the monkeys with wide-set nostrils. In Africa it grew into the man-like apes and monkeys with close-set nostrils. The lemur which remained a lemur now has its home in the island of Madagascar. That once formed part of the mainland of Africa, but the sea cut it off from the great continent, and left the true lemurs in an island home, hundreds of miles from the east coast of Africa.

The head of the lemur of to-day is like that of a fox, but it has the four hands of the monkey. Like the gibbon, it has a loud voice, and can leap long distances. It moves about at night, and goes so silently that not even a bird can hear its footfalls.

In this quiet way of creeping about it is like another member of its family, called the loris, a slim little creature about the size of a cat, with big, round eyes and sharp-pointed nose. This is also a night worker.

THE STRANGE LITTLE AYE-AYE WITH ITS WONDERFUL CLAW-FINGER

If it is wonderful that lemurs should in time grow into chimpanzees, it is almost as wonderful that they should become aye-ayes. There is hardly a more curious animal than this. It has a body something like a big squirrel; it has large ears without any hair on them, and big eyes which enable it to see at night. But the funniest thing is its hands. Those behind are like the ordinary hind feet or hands of monkeys. Those in front consist of four fingers and a thumb. But the long finger is thin and bony, like a claw of a bird. It is used for tapping the branches of trees, to see if there are any grubs hidden in them. How did the aye-aye come to be as it is? Long, long ago one or two lemurs in Madagascar were born different from other lemurs. The children of those strange lemurs were like their parents; they chose lemurs most like themselves, and little by little an entire tribe of aye-ayes was formed.

It is all very wonderful and hard for little men and women to understand and believe, but these marvelous things do happen in Nature's family of animals.

THE NEXT STORIES OF ANIMALS ARE ON PAGE 677.

The Book of GOLDEN DEEDS

THE QUIET HEROES OF THE WORLD

THERE are many kinds of heroes. The soldier who comes home in triumph, to the sound of trumpets and the waving of flags, leaves behind him on the battlefield the hero who has fallen in the fight. It is a fine and thrilling thing to see the conquering hero come, but not less thrilling is it to think of the hero who will never come again. And let us remember, always, the heroes of every day—the boys and girls who do noble things that are not written about in books. Let us remember the great heroism of simple lives, the golden deeds of quiet, simple people. We read in other parts of our book of great things done by great men and women, and many heroes will come into that story of famous people. But we shall read here of great things which have been done by simple people whose names, perhaps, are not known at all. This is the great book of simple heroes and tells of the golden deeds that light up the pathway of the brave.

A VILLAGE OF HEROES

IF you have been to Derbyshire and have traveled among the beautiful hills which are called the Peak Country, you have passed, perhaps, through the little village of Eyam. It is only a hamlet, but the sight of this little group of houses and the little village church is one of the things that ought to thrill every boy and girl who loves a golden deed.

Perched snugly in a green hollow of the rocky uplands, Eyam must have been as pleasant a village to live in as could be found in the days when William Mompesson became rector at the village church and William Stanley preached at the village chapel. That was in the time when the Great Plague of London was raging, more than 240 years ago. Eyam was 150 miles away from London, and no place could have seemed safer from the plague than this.

But the little invisible microbes that carry disease about the world come in many ways. They come on the wind, and they come in the train. They came to Eyam in a packet of patterns posted from London to the village tailor. The Great Plague of London was in that little packet, and in a few days the tailor and his family were in their graves.

There was terror in the village, and one by one the people fled. But the plague remained, and for a year it spread. All through this time the

CONTINUED FROM 570



rector and his wife, with the minister at the little chapel, nursed the people through their sickness and sustained them in their grief. In their deep sorrow the people of Eyam were like one family.

Then the brave heart of the rector's wife, Catherine Mompesson, began to fail. People were dying on every hand; there was no hope for her husband and her children, and she urged the rector to fly. In that terrible hour the rector was true to himself. He urged his wife to take away the children and save herself and them. But Catherine Mompesson was not such a woman as that. She sent her children away to friends and stayed with her husband.

The crisis had come. The plague held Eyam fast, and it was clear that any further flight of people from the village would spread the plague in the villages around, perhaps through all Derbyshire, perhaps right up through the North of England, which was yet free from it.

When this time came the people of Eyam, led by William Mompesson and William Stanley, made a great decision, which ought to be written down in the history in letters of gold. They shut themselves off from the world. The church was closed, and every day the people met to comfort one another in a cave. Trade was given up, every man left his work, the schools were shut, and the houses became

hospitals for the sick. Nobody came into the village and nobody went out, and all the work that men and women did was nursing the sick or burying the dead.

For four months Eyam was left to itself without once coming into touch with the world. Had the king died, nobody in Eyam would have known anything about it, so completely shut off were they from the world about them. They shut themselves up in June, and in July 56 of them were laid in the

churchyard. In August 72 more died, among them the brave Catherine Mompesson. So, day after day, death took away the brave people of Eyam until, in the middle of October, 1666, when the plague suddenly ceased, there was not one whole family left, and out of 300 people 259 had died.

That is the golden deed of an English village nearly 250 years ago, and the memory of this village of heroes should help to make us heroes all.

THE FRIENDSHIP OF DAMON AND PYTHIAS

DIONYSIUS was a tyrant who ruled the town of Syracuse, in Sicily. Whoever made him angry was put to death. The tyrant's wrath fell one day upon a youth named Damon, who had complained of the cruelty of Dionysius, and Damon was condemned to die. He begged first to be allowed to go to see his wife and children, but Dionysius laughed him to scorn. "Once you get out of my way," he thought, "you will never come back."

Damon said that he had a friend who would answer for his return, and his friend Pythias came forward to offer himself as surety for Damon. If Damon did not come back, he said, he would die in his friend's place.

The tyrant was astonished that a man should love his friend so dearly, and he gave Damon six hours to go to see his wife and children.

Damon expected to be back within four hours, but when four hours had gone he had not come. Five hours, then almost six hours passed, and still there was no sign of him. The happiest man in the prison was Pythias, who actually hoped that Damon would not return, because he was willing and anxious to

suffer in his place and spare his friend for the sake of his wife and children. At last the death-day dawned, the very hour drew nigh, and Dionysius came to see his prisoner die.

Quietly and bravely Pythias prepared for his execution. His friend, he said, had had an accident, or perhaps he was ill. At almost the very moment for the execution, however, Damon arrived and embraced his friend. He was tired and travel-stained. His horse had been killed and he had had to get another, but by hard riding he returned just in time to save Pythias from suffering for him. But Pythias did not wish it so. He pleaded with Damon, he pleaded with Dionysius, to let him bear the punishment.

Dionysius had never seen such faithfulness before. Here was something beautiful that he did not think existed in the world—a friendship that welcomed death if death would help a friend. His heart was stirred within him; he wanted men like these to be his friends. Going up to Damon and Pythias, as they were disputing, each eager to give his life for the other, he took their hands, set them free, and begged to be allowed to share their friendship.

THE LAST FIGHT AT THE COLISEUM

IN the proud days when Rome ruled the world, and the emperor lived in a palace of white marble, or in a house of pure gold, the Coliseum was the greatest theatre ever known to be set up on the earth.

There to this day it stands, shattered and broken, but still, perhaps, the most impressive ruin in all the world. In the dark days when Rome was falling from her great place in the world, when Peter and Paul were martyred outside its gates,

the little band of Christians hid themselves in great holes in the ground lest they should be tortured and put to death. To this day we can walk through the catacombs in which the first followers of Jesus hid themselves from Nero, the monster who lived in a golden house inside the city gates. They say that when Nero's house was burned the streets of Rome ran with melted gold.

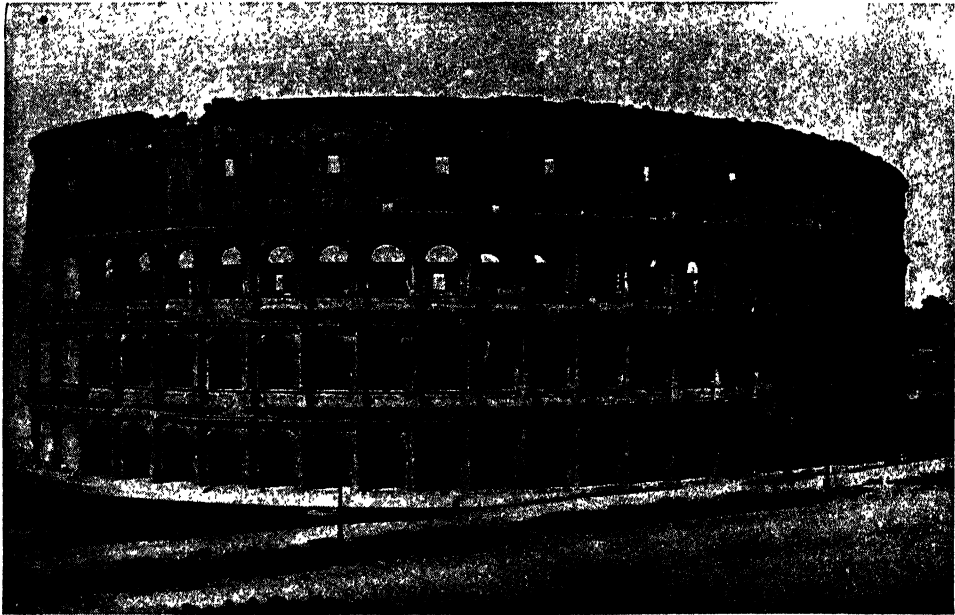
In these dark and shameful days, the great white Coliseum, rising storey after

storey from the ground, with great galleries inside to hold 40,000 people, was a wondrous sight to see. Here came all Rome to see the great wild beasts set loose and tear themselves to pieces. Here came the gladiators, strong men trained to fight each other until one of them was killed. Here the Christians were thrown alive to the lions to make a Roman holiday. No place in the world has seen more cruel sights than this.

But slowly Christianity made its way, until the very emperor became a Christian. Then these shameful things ceased, and the Coliseum became only

olden time, when suddenly there came out of one of the narrow passages leading into the arena a gladiator, with spears and swords. The rejoicing of the people knew no bounds.

Then there happened a strange thing. Into the middle of the arena came an old man, bare-headed and bare-footed, calling upon the people to prevent the shedding of blood. The crowd shrieked back to him to stop his preaching and to go away. The gladiators came forward and forced him aside, but still the old man came between them. A storm of stones fell upon him from the angry people. The gladiators struck him down,



THE RUINED COLISEUM, WHERE MEN AND WILD BEASTS FOUGHT IN THE OLD DAYS OF ROME

a circus. Still, however, the people longed to see the old sights back again, and at times the old fury would break out. The Christians had been growing stronger and stronger for 400 years, when there came a terrible day for Rome. Alaric, the leader of the Goths, came thundering outside Rome, which, having only a poor mad boy for its emperor, must have fallen but for a brave general and his men, who set the Goths to flight.

Such rejoicing there was in Rome that day that the people flocked to the Coliseum, cheering the brave general. There was a great hunting of beasts and a wonderful performance, as in the

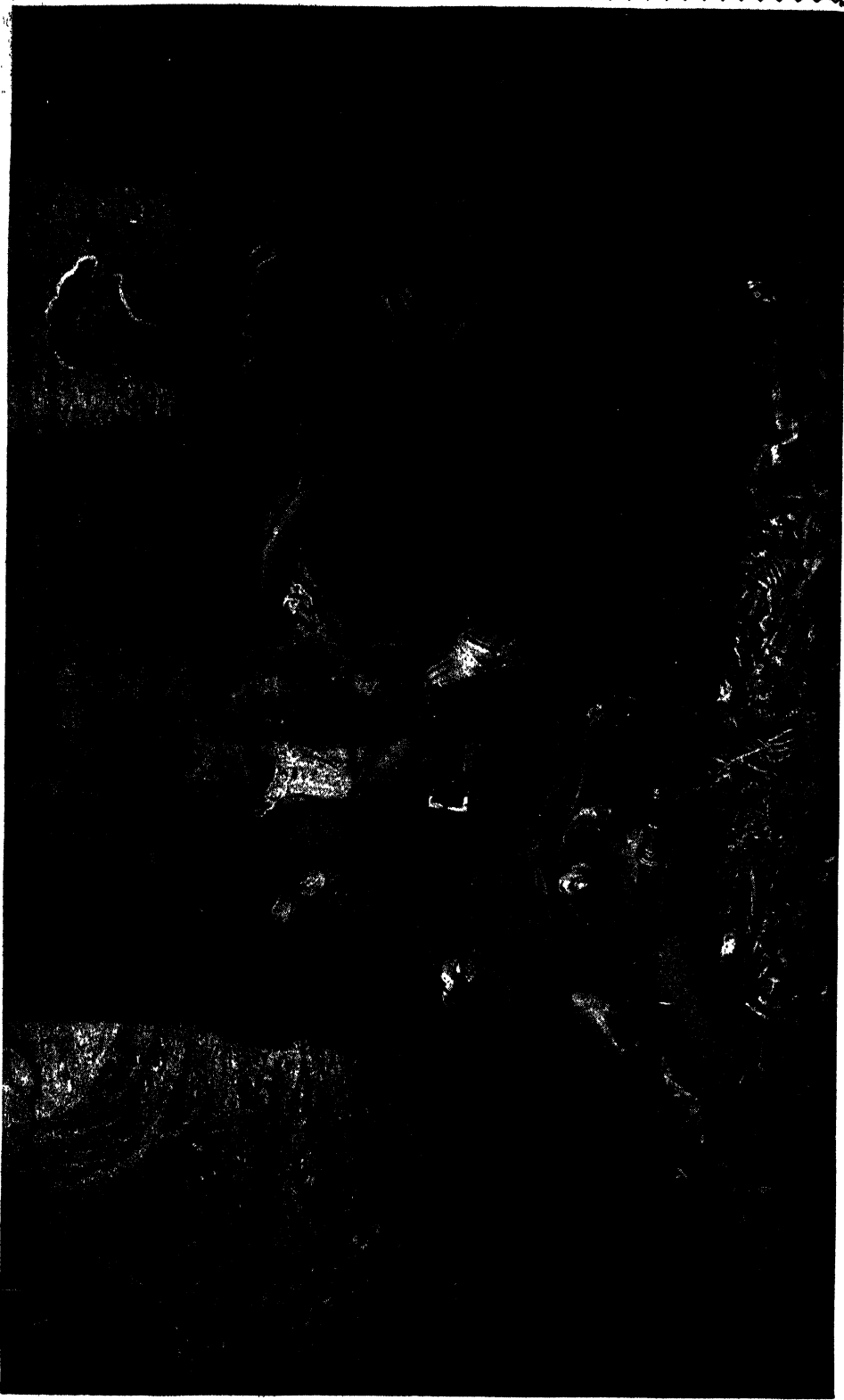
and the old man perished before the eyes of Rome.

He was a hermit, named Telemachus, one of those holy men who, tired of the wickedness of the world, had gone to live in the hills. Coming to Rome to visit the sacred shrines, he had seen the people flocking to the Coliseum, and, pitying them for their cruelty, had gone to stop it or to die.

He died, but his work was done. All that was best in Rome was stirred by the sight of the hermit slain in the midst of the arena, and there was no more slaughter in the great theatre. It was the last fight at the Coliseum.

THE NEXT GOLDEN DEEDS ARE ON PAGE 981.

ROSALIND & CELIA, WITH TOUCHSTONE THE JESTER, RESTING IN THE FOREST OF ARDEN



The Story of FAMOUS BOOKS

THE PLAYS OF SHAKESPEARE

FIVE more plays are told here, and these complete our stories from Shakespeare. "As You Like It" is one of his finest comedies. The title has very little to do with the play, but "the play's the thing." The story is one that Shakespeare got from an earlier work than his own, but very few persons have read that work, while millions have delighted in this charming comedy. "The Comedy of Errors" is one of the less important plays of Shakespeare, and was probably an early work. Nor does the "Two Gentlemen of Verona" rank among his great plays. But "King Lear" is perhaps the grandest of all his great dramas written for the stage. It is a noble tragedy, founded on an old English legend or tradition. "The Taming of the Shrew" is a very amusing comedy based upon an earlier story of the same name, and probably Shakespeare did not write the whole of it.

AS YOU LIKE IT

THERE was a kind and peace-loving duke, against whom his brother Frederick successfully rebelled, usurping his dominions. Withdrawing into the great and wild Forest of Arden, this duke, with a number of faithful followers, lived in his exile a happy and peaceful life.

One of his old friends had been Sir Rowland de Bois, who died, leaving three sons, Oliver, Orlando, and Jaques. To the first named, who was the eldest, he left all his money and estates, except one thousand crowns for Orlando. Oliver was charged to give the brothers a good upbringing, but though he provided Jaques with ample schooling, he had a hatred of Orlando, whom he kept idly at home. As Orlando grew up, he could not endure his idle life, and at length demanded the money which his father had left him, so that he might go away from his brother's house.

Oliver, wishing to keep the money, arranged with a great wrestler, who was a servant of Frederick, the usurper, to challenge Orlando to a match, believing that his brother might be killed if he fought the wrestler.

The match was duly arranged, and among the spectators were Frederick's daughter, Celia, and her fair cousin, Rosalind, whom Frederick allowed to live at the palace, although she was

the daughter of the exiled duke, the two girls being inseparable friends. When

Rosalind saw that so young a man was to fight the champion wrestler, she begged of him to refuse. Orlando, however, was not afraid; and, to the surprise of all, he overthrew the champion.

Frederick, who witnessed the combat, was about to congratulate the victor, when he heard that he was the son of his old enemy, and the praise on his lips changed to anger. But Rosalind, in admiration of Orlando's bravery, gave him a chain she was wearing. This action so annoyed Frederick that he now banished her from the palace. Perhaps he had been waiting for the excuse, as Rosalind was so beautiful in person, and so witty in mind, that his own daughter, Celia, though comely and pleasant, suffered by contrast with the bewitching daughter of the banished duke.

Celia dearly loved her cousin Rosalind, and had not the least jealousy of her charms, so that when her companion was banished from the palace she did not hesitate to share her fate, and they went away together, taking with them the witty jester, Touchstone, whose comic sayings would cheer them on their way.

They did not go, of course, in the rich dresses they wore in the palace. Rosalind, who was "more than common tall," dressed herself like a

shepherd, while Celia put on the clothes of a shepherdess. Their destination was the Forest of Arden, where the banished duke held his rustic court.

Now, when Orlando was returning to the house of his brother, he was met by an old servant of the family named Adam, who loved the youth so much that, knowing Oliver meant to kill him, he had brought all the savings of his life, some five hundred crowns, and urged Orlando to go away with him. They, too, set out for the safe seclusion of the famous forest.

Rosalind and Celia in due time gained the shelter of the forest, where at length they found a lodging in a little cottage; but what perplexed them greatly was to discover little verses written on paper and placed in the trunks of trees, expressing great love for Rosalind. Who could the unknown rhymers be? Celia undertook to find out, and traced him at length to Orlando, whom Rosalind, still pretending to be a man, promised to cure of his love if he would come each day to the cottage and make love to her in the name of Rosalind.

The flight of the two ladies from the palace had led Frederick, the usurper, to accuse Oliver of sheltering them and Orlando, little knowing how Oliver had tried to rid himself of his younger brother. So Oliver, too, was banished from court, and, in common with the

other exiles, made for the forest, where he would have been killed by a lion had not Orlando rescued him at the cost of injury to himself.

This noble action so shamed Oliver that he took his brother to his heart; and since Orlando, being injured, could not visit Rosalind's cottage as usual, Oliver went there to explain his absence, and, seeing Celia dressed as a shepherdess, fell in love with her forthwith.

It was arranged that the wedding of Oliver and Celia should take place at the duke's encampment, and as Orlando protested that he still loved the lady who gave him the chain, Rosalind promised she would bring her to him at the wedding of Celia; which she did, of course, by putting off her disguise and appearing there as her own delightful self, not only to the joy of Orlando, but also of her father, the duke.

Oliver was now so happy that he promised to give Orlando his estates; but presently news came that Frederick himself was on the way to kill his brother, the banished duke. By a strange chance, however, he met a good old man who spoke to him of the evil life he was leading, and so changed his mind that he determined for the future to give his thoughts to religion, and surrendered to the duke the dominions which he had unlawfully usurped.

Thus happiness was restored to all.

THE COMEDY OF ERRORS

THERE was a rich merchant of Syracuse, named Ægeon, who had twin boys, and these he christened with the one name Antipholus. It so happened that at the same place there were two other twin boys, whose mother was very poor, and Ægeon conceived the idea of buying these poor children, who had both been named Dromio, to bring them up as servants to his own twins. But when returning to his home by sea a great storm arose, and the merchant himself, together with one of his own children and one of the Dromios, was rescued and taken to Syracuse, while, unknown to him, his wife, Æmilia, and the other two children were rescued and taken to Ephesus, Æmilia, however, being separated from the children.

Time went past, and the twin children grew to manhood without ever hearing

of each other. When Antipholus of Syracuse and his attendant Dromio were nearly twenty years of age, they set out to search for their brothers, but Ægeon, thinking the searchers lost, as they had not returned after some years, himself went forth to seek for them. At length Ægeon, his money all spent, found himself in Ephesus, where, admitting that he was a merchant of Syracuse, he was thrown into prison by the Duke of Ephesus, because the Duke of Syracuse had recently killed a merchant of Ephesus who had been unable to ransom himself.

Now, we must know that the son whom Ægeon had lost in the shipwreck, together with the other Dromio, had lived all this time in the town of Ephesus, while his wife, Æmilia, had become the head of a priory. Antipholus of Ephesus

THE COMEDY OF ERRORS

was a favorite of the duke. We can therefore see how the errors would begin when Antipholus of Syracuse, of whom Ægeon was in search, together with his particular Dromio, also arrived in Ephesus. As Antipholus of Ephesus had married a charming lady of that town, and his Dromio had married also, while both their brothers were still unmarried and knew nothing of each other, the new-comers to Ephesus had not been there long before everything was in a muddle. The one Antipholus mistook the other's Dromio for his own servant. Dromio of Ephesus mistook Antipholus of Syracuse for his master; while the latter was mistaken by his brother's wife for her own husband. And so on, until none of them knew whether they stood on their head or their heels.

Out of the last "error" came the explanation, which put all things straight again. For Antipholus of Syracuse, naturally denying to Adriana, the wife of his brother, that he was her husband, and behaving so strangely—as she thought—had to take refuge from her and her friends, who would have had him bound as a madman, by running into the priory of which, unknown to him, his own mother was the prioress.

Adriana appealed to the duke, who

was passing the priory at the time, and he was asking for an explanation, when her own husband and his attendant came up to complain of a jeweler who was charging him for a debt which he had not incurred, the debtor really being the Antipholus who was inside the priory.

At this very moment Ægeon, too, was being taken round the town as a prisoner held at ransom, and when he saw Antipholus and Dromio of Ephesus he thought they were the son and attendant of whom he was in search, though they, of course, denied all knowledge of him; but when Æmilia herself appeared she asked the aged prisoner if he was indeed the father of the twins named Antipholus. This he acknowledged, and she then told him that she was their mother and his wife, but, being parted from the children by some fishermen of Corinth after they were rescued, and believing herself alone in the world, she had entered this priory, of which she was now the head.

The tangle was soon made straight after this explanation; old Ægeon was released, and the family united after so many years and so many "errors." The bond of friendship, too, was strengthened when Antipholus of Syracuse became the husband of Luciana, sister of Adriana, his brother's wife.

THE TWO GENTLEMEN OF VERONA

THERE were two gentlemen in the town of Verona, named Valentine and Proteus, who were friends and close companions, until one of them fell in love with a lady of Verona named Julia. It was Proteus who had fallen in love, and that was quite a good reason for his refusing to accompany Valentine on his travels, though perhaps not so good a reason for Valentine to make fun of him. So Valentine set out on his travels alone, going first to Milan.

Meanwhile, thanks to an uncle of Proteus, the father of that young gentleman had been urged to send his son away, so that, when he grew old, Proteus might have no reason to regret that in his youth he had been a stay-at-home, and had neglected to see the world. His father, Antonio, therefore sent his son after Valentine to Milan, that he might have the company of his friend, which he had before refused.

When Proteus got to Milan the comedy

had begun, for, behold Valentine, who had scoffed at his friend for being in love with Julia, now himself deeply in love with Silvia, the bewitching daughter of the Duke of Milan. And his case was worse, for, being poor, he could not hope that the duke would let him marry his daughter; whereas Proteus was at least in love with a lady of his own station in life. Like Romeo with his Juliet, Valentine's only plan was to marry his Silvia without her father's consent, and he had quite made up his mind to climb to her window and carry her away, when Proteus overtook him in Milan.

Valentine's scheme was quickly upset, for no sooner had he disclosed it to his friend than the latter, on seeing the lovely Silvia, also fell in love with her, and began to forget his Julia left in Verona. Nay, worse; he betrayed Valentine's intentions to the duke.

The duke now wished to convict Valentine of his intention to abduct Silvia,

without disclosing to him how he had come by the knowledge of the plan. So, pretending that he himself was in love with a widow of Milan, he asked Valentine what he would advise him to do—rather a foolish question, one might think, for a duke who had already been married to ask a young man who was still unwedded. But the wisdom of the duke lay in the fact that he knew none to be so foolish as a young man in love.

Judge if the duke was wise or foolish, when Valentine innocently advised him to do exactly what he had himself purposed doing—to carry away the lady. He even lent the duke his own coat as a disguise, and in the pocket of the coat the duke found a letter from Valentine addressed to his own daughter.

This discovery gave the duke an excuse for banishing Valentine from Milan, and he now set about his own plans to marry Silvia with all speed to a foolish young nobleman named Thurio; but he enlisted the services of Proteus to help forward the match, little thinking that Valentine's friend was himself in love with Silvia.

Proteus was expected to give so poor an account of Valentine to Silvia, and so glowing an account of Thurio, that the maiden could not but decide to forget Valentine in favor of the foolish nobleman. But, of course, Proteus did nothing of the kind. He made his own suit to the lady, and plainly showed her that he was in love with her.

One night Proteus, with Thurio and some musicians, came beneath the lattice window of Silvia in the court of the palace, and sang a love-song to her.

But Silvia was not the only lady who heard this love-song. Julia, no longer able to endure the absence of her lover, had left Verona disguised as a page, and, following Proteus to Milan, she had overheard this song.

When Proteus thinks himself alone, he declares his love to Silvia, who comes to the window, but she chides him for his faithlessness to his friend Valentine, to whom she declares herself betrothed; and he tells her that both the lady he loved at Verona and Valentine are dead, and pleads to have Silvia's portrait. This she promises him, saying that she is loth to be worshipped by him, but since she believes him false, he is the better fitted "to worship shadows and

adore false shapes," meaning that he can admire her portrait, but need not admire herself, as she does not care for him. All this is overheard by Julia, who is hidden in the shadow.

Next day Proteus sends Julia—who, disguised as a boy, has applied to him to be employed as his page—for the portrait, and gives her a ring to take to Silvia, the very ring Julia herself had given him before he left Verona. She is comforted to find that Silvia rejects his suit, and that she is displeased with him for his faithlessness.

Silvia, true to Valentine, has determined to escape from Milan, and by the aid of a courtier named Eglamour she sets off towards Mantua, but in a forest they are set upon by outlaws, and Silvia is captured.

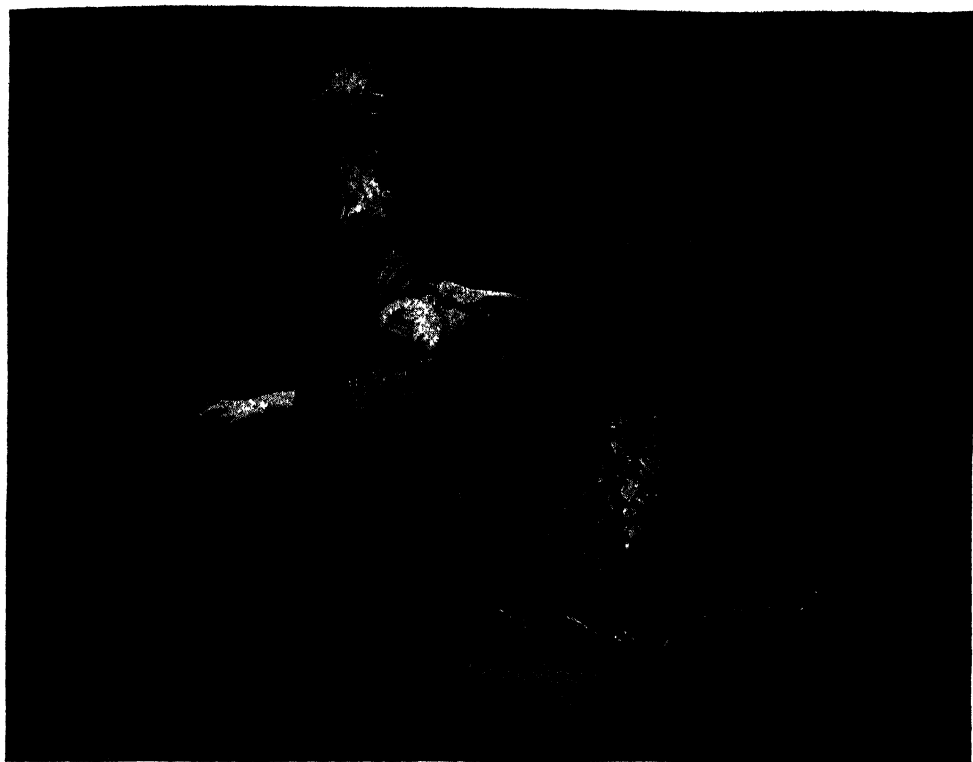
Happily, when Valentine had been banished from Milan, he, too, had fallen in with these very outlaws, who spared his life on his promising to become their leader, as they would be honored by having a nobleman for their chief. So Silvia had fallen into the hands of her own true love!

Her escape from Milan led to the duke and the others following in pursuit, Julia going with the party as page to Proteus; and they, too, were set upon by the outlaws, the duke and Thurio being captured and brought before Valentine. There they saw Silvia, and the foolish Thurio exclaimed: "Yonder is Silvia, and Silvia's mine." But Valentine dared him but to breathe her name, and the cowardly Thurio, seeing the bold lover angry, and knowing his own life was in danger, forthwith changed his tune to:

Sir Valentine, I care not for her, I;
I hold him but a fool that will endanger
His body for a girl that loves him not;
I claim her not, and therefore she is thine.

The duke, admiring the boldness of Valentine as greatly as he detested the cowardliness of Thurio, was at once won over to his daughter's side, and gave her to Valentine, who took the opportunity of securing a free pardon for his fellow outlaws, while Julia had meanwhile disclosed to Proteus how her love for him had brought her after him from Verona, and he was once more at her feet.

So the return to Milan meant happiness for all; even for the foolish Thurio, for if he had lost the duke's daughter he had saved his own cowardly neck, which he valued more highly, if we may judge by his ungallant conduct.



Lear, the aged King of Britain, in his old age gave up his possessions to two of his daughters who did not love him but gave nothing to his daughter Cordelia, who married the King of France. When the French invaded Britain, the old king was sheltered by Cordelia, but she and her father were taken prisoners by the British soldiers. This picture of Lear and Cordelia is painted by Mr. Joy.

THE TRAGEDY OF "KING LEAR"

LONG ago there was a King of Britain whose name was Lear. He was over eighty years of age at the time of the story. So, old and worn with the cares of his kingdom, he decided that the time had come to give up his crown and his possessions, and spend his few remaining years in peace.

But King Lear had no son to succeed him; he had only three daughters. The eldest of these was Goneril, wife of the Duke of Albany; the second was named Regan, who was married to the Duke of Cornwall; and the youngest and most beautiful, Cordelia, was still unmarried. Between his three daughters the aged king determined to divide his kingdom, so he called them together to tell them of his purpose, saying that he would give the largest share to the one that loved him most.

Goneril, a selfish, cold-hearted woman, pretended that she loved him more than her eyesight, grace, health, beauty, honor — more than life itself. Regan,

who was like her elder sister in character, protested that even the extravagant declaration of Goneril's love for her father was not strong enough for her. All her joy, she said, was in finding favor with her father.

Carried away by the loving words of these two false, selfish women, the old king gave each a third of his kingdom; but when the kind-hearted Cordelia, who did truly love her father, would not exaggerate the terms of her love beyond those which a dutiful daughter should employ, Lear was enraged at her, and gave her nothing, dividing her share of his kingdom between her two sisters.

Cordelia, however, was not without consolation, as the King of France, who loved her for her sweet and gentle nature, made her his queen. So insensible to reason had the old king grown, that the faithful Earl of Kent was banished because he had ventured to plead with Lear on behalf of Cordelia. The kingdom of Britain was now divided between

Goneril and Regan, whose husbands, the Duke of Albany and the Duke of Cornwall, thus shared the power of the old ruler. Lear fondly hoped to spend his days between the homes of his two children, attended by a retinue of one hundred followers. But he had not been long in Goneril's palace before he discovered that her love for him was all a sham. His daughter did everything she could to make his life unhappy, so that the old man was forced to leave with all his followers.

He went to the castle of the Earl of Gloster, an old friend of his, who had acted in regard to his own two sons almost as foolishly as Lear had done to his own daughters. Gloster's son Edmund, an evil-minded, selfish, and unscrupulous man, was his favorite, while Edgar, his proper heir, a brave and honest son, had unjustly been forced by Edmund's scheming to leave the home of his father.

At Gloster's castle more sorrow was in store for Lear, as there he met his daughter Regan, who had come to plan with Edmund how she might escape the nuisance of her father and his followers. Goneril herself came to the castle, and the two daughters did all they could to make the poor old king unhappy, declaring finally that he needed no servants at all.

Utterly broken-hearted, Lear now wandered away, accompanied only by his jester, but followed soon after by the faithful Earl of Kent, who had disguised himself in order to be of service to his old king. On a wild and lonely heath, and in the midst of a great storm, they came upon a hovel inhabited by one who seemed to be a madman, but was really Edgar, the banished son of Gloster, feigning madness.

Now, the Earl of Gloster would gladly have stood by Lear in his trouble, though he had been warned against rendering him assistance. Gloster, however, told his false son, Edmund, that he meant to help King Lear in secret, and also showed him a letter just received which brought the news that a French army was coming to attack the British. Here was Edmund's chance. He straightway bore the letter to the Duke of Cornwall, and also told him of his father's intentions to succor the unhappy king. For this service his father's earldom was given to Edmund.

In the meantime Gloster had housed in a farm near his castle, not only Lear and the jester, but Kent and his own son, Edgar, both of whom were, of course, disguised. He then had the king sent on to Dover, where the warriors of the country were gathering to meet the French, with whom was Lear's faithful daughter, Cordelia.

The Duke of Cornwall was quickly on the track of Gloster, whom he had arrested, and in his anger at the earl's efforts to save the king he blinded him, but was mortally wounded himself by one of his own followers, enraged at his cowardly brutality.

The tragedy was reaching its height, for the sightless earl was now led to Dover by none other than his own son, Edgar, and, nearing the town, he came upon King Lear, gone out of his mind, fantastically decked with flowers. A follower of Goneril, meeting them, sought to kill the Earl of Gloster, but Edgar fought and slew the man, and discovered that he was the bearer of a love-letter from the faithless Goneril to his own stepbrother, Edmund.

Lear was now brought to the French camp at Dover, where his daughter Cordelia, who had never ceased to love the father who had wronged her so much, received him tenderly and tried to console the aged king, now as feeble in mind as in body.

But the war between France and Britain was not so fierce as that which now raged between Goneril and Regan. These two faithless sisters had both fallen in love with the villain Edmund. When Edgar gave Goneril's letter to the Duke of Albany, the duke challenged Edmund to a duel, just after a battle had been fought in which King Lear and Cordelia had been taken prisoners.

Edmund was fatally wounded by the duke; but meanwhile the two unhappy women who had been the cause of all this sad tragedy had settled matters in a drastic way. Goneril had contrived to poison her sister Regan, out of jealousy at her love for Edmund, and she, when her own guilty secret was laid bare by the discovery of her love-letter, stabbed herself and died.

All too late, Edmund, now dying of his wound, and repenting of his evil conduct, asked that the life of Cordelia might be spared; but, at the very

KING LEAR

moment when he was breathing his last, the weird figure of the old king carrying the dead body of Cordelia appeared. The last blow in the great tragedy had been struck.

The Duke of Albany, who had always been friendly towards King Lear, despite the evil influence of his wife, would

now have had the aged king resume his power, but that was hopeless; his heart was broken and death was upon him.

The duke, however, showed his feeling for Lear by rewarding both Edgar and Kent for the services they had rendered to the poor old king in his hour of need.



Petruchio was a gentleman who undertook to "tame" Katharina, a very hot-tempered lady whom he married. His plan was to pretend he was always in a temper. He dressed absurdly, and when proper clothes were brought in he threw them on the floor and behaved so badly that at last Katharina saw it was best to obey her husband. His plan succeeded, as we learn in "The Taming of the Shrew."

THE TAMING OF THE SHREW

A "SHREW" means a woman whose temper is fiery; who is never satisfied with things; nagging, peevish, always finding fault.

We are to suppose, then, that Katharina, the elder daughter of Baptista, a rich gentleman of Padua, in Italy, was so ill-tempered that she could be described as a shrew. Perhaps at heart she was neither selfish nor ill-feeling; but possibly, being spoiled by her parents as a child, she had grown into these unfortunate habits, which made her so unpleasant a companion that there seemed little likelihood of anyone marrying her, although it was known that she would receive great wealth from her father.

Quite the opposite to Katharina was her younger sister, Bianca. Charming to look upon, gentle and winsome in her character, and beloved by all, we may be sure there was no lack of gallant gentlemen who would willingly have married Bianca. To some of her suitors Baptista announced that he would not allow Bianca to be married until her elder sister had found a husband. In the meantime, he intended that the young ladies should have the best possible teaching in the accomplishments of the time, and asked that any good tutors might be recommended to him.

At this time there had come to Padua, which was famous for its colleges, a young gentleman of Pisa named Lucentio, son

of a rich noble of that town. His purpose in Padua was to study, but he had no sooner set eyes on Bianca than he fell in love with her, and thoughts of study were soon dismissed.

On learning that Baptista wished to engage tutors for his daughters, Lucentio planned with one of his own servants, Tranio, that the latter should impersonate him as a rich gentleman come to Padua to pay court to Bianca, while he himself would contrive to be engaged as tutor to the two ladies. It was so arranged, and before long Bianca was in love with her handsome and agreeable instructor.

But in the meantime one of Bianca's other suitors, a gentleman named Hortensio, had enlisted the aid of a merry friend from Verona, who undertook no less a task than to marry Katharina, and thus leave Bianca free to marry Hortensio. This was Petruchio, who was at once clever, masterful, high-spirited.

Petruchio began his love-making to Katharina by addressing her as "Kate," in order to annoy her; when she scolded he pretended to find her "passing gentle"; and, finally, when she struck him he promised her as good as he had got, assuring her that, whether she cared for him or not, he meant to marry her. When her father came upon the scene, the dashing Petruchio calmly informed him that they had arranged for the wedding to take place next Sunday.

When Sunday came, and Petruchio arrived for the wedding, he presented an extraordinary figure, wearing a new hat, an old coat, shoes that were not neighbors, a rusty sword, and mounted upon a horse so old and skinny that it was of no more value than the rubbishy harness it wore. His servant was no less strangely attired.

Baptista was thoroughly ashamed of the bridegroom, but Petruchio refused to change his clothes, as this was a part of his scheme for "taming the shrew."

In the church he behaved quite scandalously, insulting the priest, and kissing Katharina so loudly that the building echoed with the sound. Nor would he wait for the wedding feast, but set out at once with his wife for Verona.

Their journey was one series of misfortunes, and the bridegroom behaved as if he cared nothing for his bride. The

last part of the way they had to walk, owing to their horses taking flight when Petruchio was thrashing his servant, and they arrived, footsore and weary, at his residence, where he made matters worse by complaining about everything, throwing the food on the floor and beating his attendants.

In this way Petruchio behaved for a time, and was always in so bad a temper that Katharina had no chance to show how bad her own temper was. Hortensio came to see them, and Petruchio decided they would return with him to Padua, promising that they should both go there dressed according to their rank. But when costumes for Katharina and himself were brought in to choose, he declared them all unsuitable, throwing them on the floor, and when they did set out he was still wearing his dress of odd clothes.

At Padua, meanwhile, Baptista had promised Bianca would be wedded to her richest suitor, and this was Tranio, who was playing the part of Lucentio, while the latter pretended to be merely the teacher of Greek and Latin. Tranio arranged with an elderly man to impersonate the father of Lucentio, and got him to give his consent to the wedding, inviting Baptista to his house to arrange the matter, while Bianca was to follow with a servant.

Bianca did follow, but with the pretended tutor, Lucentio, who took her to church on the way and married her. When Lucentio arrived at his own house at Padua, his real father from Pisa had just come to visit him, so that Lucentio was in time to kneel at his feet and ask at once his pardon and his blessing.

The journey of Petruchio and Katharina back to Padua was conducted in the strangest way, Petruchio insisting on his wife agreeing to his most ridiculous statements, and making her kiss him publicly in the street under threat that they would return to Verona if she were ashamed to do so.

Indeed, by the time they reached Lucentio's house there was no more obedient wife in all Italy. Katharina was actually so "tamed" that she even made a little speech to the other ladies present on the virtue of a wife's obedience to her husband.

THE NEXT STORIES OF FAMOUS BOOKS BEGIN ON PAGE 697.

The Story of THE EARTH.

WHAT THIS STORY TELLS US

THIS story tells us of one of the things of which the earth is made, a thing so wonderful that it seems when we read of it as if we were reading about fairies. This wonderful thing is called Radium, and nobody knew anything at all about it until a few years ago. Radium is one of the things that keep the earth warm, and it has the secret of making heat out of itself, just as the plant has the secret of making food out of the air. All the radium that men have found throughout the world at present is not enough to fill a pill-box; you could put all the radium that has been seen by the eyes of men on a single dime. But *there is a very little radium everywhere*, and it is the presence of this very little radium everywhere that helps to keep the earth warm. We may think of radium as a little bit of fire everywhere—a fire that never goes out, but that will keep the earth warm for ages and ages to come.

THE FIRE THAT FEEDS ITSELF

WE have recently made the astonishing discovery that, besides the way we read of on page 568, there is another way, undreamed of until this century, in which the earth is kept warm, and has for ages past been kept warm—and will be kept warm for no one can say how many ages to come.

It is true that the earth is losing its heat, but we have discovered that, while it is losing its heat, it is actually *making new heat for itself*. Of course, you see the importance of this. If you have six pennies in your pocket, and spend one every day, when a week is out you will have nothing left. But if, while still spending, you can also make a new penny every day—well, you can go on for a long time at that rate! Now, that is what the earth is doing; it is spending its heat—which is a good thing for us, for we should not be here without it—but it is also making new heat. Nay, more; there is every reason to believe that the earth is making every day, or every year, or every million years, at least as much heat as it loses. Therefore, it is not getting cooler; just as the little boy who spends a penny and makes a penny every day is not getting poorer. Now, the stuff which makes the new heat for the earth is called radium.

If I were to start to tell you now all the wonderful things about radium, I doubt whether I should ever finish,

CONTINUED FROM P. 568



for new things are being found out almost as fast as we can write about the old things. But here, at any rate, we must read about radium, because we must clearly understand this discovery regarding the earth's heat—one of the most wonderful and important discoveries ever made. Here, then, let me explain for a moment—what we shall come back to—that matter is made up of many different kinds of things, which are called elements.

It used to be thought that there were four elements—earth, air, fire, and water—and little boys and girls still play a game based on that idea. But now we know that none of these is really an element. We all know many real elements, however—lead and gold and silver and quicksilver, and also the oxygen of the air, which we are breathing at this moment. Well, radium is just another of these elements. It is one of the last to be discovered, perhaps one of the rarest of all elements, as there is very little of it to be found anywhere; but it is far more wonderful than all the other elements put together.

Now, one of the wonderful things about radium is that it is all the time making heat out of itself. Lead and silver and oxygen cannot do this. If they are warm it is because something has made them warm from outside, just as the poker—which is made of the element iron—becomes warm if you put it in the fire. But radium

left by itself, without any warmth from outside, makes heat for itself, and, wherever you find it, it is always a little hotter than its surroundings—like nothing else in the whole world, except, of course, fire itself. That, though it is rather difficult to explain, is an absolutely different thing, because, so to say, fire has to be paid for. In fact, the heat produced by a fire is really heat from the sun, which was stored up in the coal and is given out again.

THE MYSTERIOUS POWER IN RADIUM THAT WILL HEAT THE EARTH FOR AGES

But the extraordinary thing about radium is that it does not require to be burnt in order to make heat, and that the heat which it makes is not the sun's heat of the past given out again, but is absolutely made brand new, so to speak, on the spot.

Now, this is a subject on which we can easily get wrong ideas, and quite the most wrong idea that we could get would be to suppose that radium gets its heat from nowhere, that it makes it out of nothing. That is not so. If there is anything that we are absolutely certain of, it is that nothing is made out of nothing. If radium makes heat, as it does, and if it does this without any heat from outside, as it does, then we know for certain that there is some kind of power inside radium itself which radium uses in order to make heat. That, we know, is exactly what happens.

Our new discovery, then, does not mean that the earth has a source of heat which can never be used up, but that it has means of making heat which will probably not be exhausted for ages longer than we can think about.

ALL THE RADIUM THAT MEN HAVE SEEN COULD COME INTO A PILL-BOX!

But we have left out something; we have not satisfied ourselves that there is enough radium to do all these things. All the radium in the world *that has been collected* would not weigh as much as a golf-ball! Not only so, but there are only one or two known places in the world in which radium can be found. Little streaks—or veins, as they are called—of stuff containing it are found in the granite and slate in Cornwall, and there is a considerably larger quantity in Austria. Yet in the course of several years, since radium was first discovered, not enough has been collected to fill a pill-box.

Plainly, if that were all there was to say, it would be absurd to suggest that the radium in the earth is enough to keep the earth warm. But now the discovery has been made that there is radium to be detected, though perhaps not to be *collected*, in other places besides Cornwall and Austria. I said that radium was one of the rarest of the elements, if not the very rarest.

We may say that while there is only very little of it to be found anywhere, yet there is *a very little of it to be found everywhere*. Lately men have taken samples of water and every kind of earth and rock that you can think of, and wherever they make tests to find whether radium is present, there they invariably find it. Of course, the amount is extremely tiny. If it were not, it would make the earth so hot that we could not live on it. Perhaps you will scarcely believe how tiny a proportion of radium can be detected; but this is not so difficult to understand if we remember that radium is a very extraordinary and active substance, which is, so to say, doing things all the time, and doing them so powerfully that its presence is not difficult to detect.

THE VERY LITTLE RADIUM THAT LIES ABOUT US EVERYWHERE

You can find a very small boy in a very big house if he makes noise enough, and you could find a needle in a haystack if it were shouting all the time. That is the sort of thing which explains how it is possible to find radium present in a rock, even though there is only one part of it there to a million million parts of rock. And that is possible, whatever you may think. The man who has been able to do this is an Englishman. His name is the Hon. R. J. Strutt, and he is the eldest son of Lord Rayleigh, at one time the president of the Royal Society. Now, that is the proportion of radium which actually occurs in one of the most familiar of all rocks, granite, and in the same way radium is found in other rocks and minerals.

Now you will say next that, even supposing there is this tiny amount of radium in rocks and minerals in general, all over the crust of the earth, and even supposing that some such quantity as this could be found in all the stuff that makes up the crust of the earth—which

is supposed to be about forty or fifty miles thick—yet surely such a tiny proportion could not be enough to make up, day by day, for the amount of heat which the earth is always losing into space. But the extraordinary fact is that this very small amount of radium is abundant for the production of enough heat to keep the earth as warm as it is, as warm as it has been for ages past, and as warm as it will be for ages to come.

RADIUM MAY BECOME A CLOCK TO TELL THE TIME OF THE PAST

The wonders of radium never cease, and the more wonderful we find it to be, the more information it gives us. It is now turning out to be, in a sort of way, a clock which tells us of the past. I can show you how this is, and it is not difficult. As radium goes on making its heat, it changes, and one of the results of its changing is that it always produces another element, called *helium*—after the Greek name for the sun, because it was first found in the sun in a wonderful way of which we shall talk afterwards. We can watch radium from day to day, and we can measure precisely the exact rate at which it makes helium out of itself. Now, that gives us exactly what we want; for it is plain that it, in a certain kind of rock, we find a certain quantity of helium—which is always made from radium and never in any other way—then it is quite easy to calculate how old that rock must be.

That is what is being done now. Men are examining different kinds of rock from different levels in the crust of the earth, and are finding out exactly how much helium they contain, as well as how much radium. The amount of helium and radium tells them how long the radium has been in the rock—that is to say, how old the rock is.

THE VERY LITTLE PART OF THE EARTH THAT WE KNOW ABOUT

Here, then, is a new and unexpected way in which we hope soon to get a better answer than any we have ever had before as to the age of the outer layers of the earth's crust. As to the deeper part of the earth's crust, we can say very little; but that is less interesting, as they were laid down long before life appeared.

The kinds of rock that we can get at to examine quite easily are those which belong to the ages of life; and we can,

to a certain extent, examine other rocks, such as granite, which were made under the influence of great heat before life appeared, and pieces of which have sometimes got squeezed up to the surface, so that we can get at them.

Now, in finishing this part of our story, I want you to reflect with me over something which I think is very wonderful. Here we are on this earth of ours, and we cannot leave it; but you might at least think that, though we cannot leave it alive, and perhaps do not want to leave it, at any rate we can thoroughly examine every part of it. Now, this is not so. There are parts of the earth, even at the surface of it, which no human eye has ever seen, and only recently have the North and the South Poles been reached. No one has ever been to the top of the highest mountains in the world. The ocean of air that floats above us is part of the earth, of course, and it probably extends at least something like a hundred miles high. No one has ever been as high as a tenth part of this distance.

NO MAN WILL EVER GET DOWN TO THE CENTRE OF THE EARTH

Then, again, as to digging downwards. Certainly, no human being will ever get down to the interior of the earth. His whole body would have melted into gas long before he got there. But take this thin crust, which has produced such wonders. Compared with the whole thickness of the earth, it is a mere nothing—40 miles out of 8,000; that is to say, the crust of the earth is 200 times thinner than the earth itself. There never was an orange with anything like so thin a skin as that.

Now, a little while ago we were talking about cutting the earth in half and seeing what it would look like. What have we done in the way of cutting into this thin crust that supports us? Practically nothing. We measure coal-mines by thousands of feet, but as we go down it gets very hot, and it is a very serious matter to get air enough down to these levels. When all is said and done, the deepest coal-mine has only got as far as the coal level, and that, compared with the whole crust of the earth, is almost nothing at all.

But this is the point I want you to remember, and this is why I raised the question at all. It is because I want you

to distinguish, now and always after this, between what man can do with his body and what man can do with his mind. I do not think there is any more important thing that the wisest of all the wisest men can teach us.

**THE POWER OF OUR BODIES IS
REALLY VERY SMALL**

In a thousand ways our bodies are the most wonderful things in the world, yet they are sadly limited, and in a few years they begin to grow old, and then they die. They require a great deal of care, but no care will keep them alive very long. They cannot leave this tiny earth—for it really is tiny, and we only think of it as large because our bodies are so very much tinier—they cannot even be taken to every part of its outside; they can only soar a mile or two into its atmosphere, and dig a mile or two into its crust, and all that at very great cost and at very great risk.

But that is only the body we are talking about; it would all be false if it were said of the mind. You can sit where you are sitting now, and your mind can go to the farthest star, and a million miles beyond it. We knew what the South Pole was like, before anyone had ever been there. We know how deep the ocean of air is, and what kind of gases are found near its surface. We know the thickness of the crust of the earth, and are learning how to measure its age. The mind can measure the height of Mount Everest, though no human foot has ever stood upon its summit.

**THE POWER OF OUR MINDS CAN
NEVER BE MEASURED**

Every day the mind is teaching us more about the earth. Every day, though the eyes of our heads are getting more and more short-sighted—because we all spend such a lot of time nowadays reading and writing, instead of running to catch our dinner in the forest or on the plain—the eyes of our minds are getting to see further and further, and wider and wider, and to see more and more at a time, and to understand what it is that they see.

So, though we must not be proud, and though all that we know about the earth or anything else is only just a speck compared with all that there is to know,

yet we must not be ashamed because our bodies are so limited in their powers. We are human, and that is to have human minds. We have done great things already, and we shall some day make the earth, of which we know so little at present, a home that is worthy of us.

The body is weak and needy, and cannot do much we should like it to do; and the body dies, and new bodies have to begin at the beginning. But the mind, though it makes mistakes and cannot do all we should like it to do, is far more powerful, and its eyes can see what the bodily eyes have never seen and never will see. And, though we die, the work of our minds, if it is good and real, does not die. The minds that come after us *do not have to begin at the beginning*, though their bodies do. They stand on our shoulders, so to say, and thus they see farther.

**OUR BODIES MAY DIE, BUT OUR
MINDS GO ON FOR EVER**

Mr. Strutt found radium in many parts of the crust of the earth, but this was because Monsieur Curie—who is already dead—and his wife had found radium before. And they themselves could do this because of the work of a great Frenchman, M. Becquerel, who himself was building on the foundations laid by those who went before him. Their bodies are dead, as ours will be before this century is finished; but their work lives, as ours will also.

We must go back to the beginnings of science thousands of years ago, and name thousands of men before you have really named all those who were working through Mr. Strutt, though their bodies were scattered into dust ages ago, and even the names of many of them are forgotten. And this is the way in which mankind goes on and on. We have learned to read and to write, but we did not invent reading or writing, or letters or paper, or printing, or ink. Dead men and women have done most of the works by which we live now; and we, too, can help men and women who are yet unborn. Animals cannot tell what they have learnt to their children; we can. And so we learn the truth, and how to forget the untruth, and that is progress.

The Book of FAMILIAR THINGS



GRAPE FRUIT

WHERE THE FRUIT COMES FROM

WE who live in the United States and Canada should feel greatly blessed in the abundance and cheapness of the fruit which we ourselves grow or else are able to get at small expense. Nothing is more disappointing to Americans, when they travel in Europe, than their inability to get all the fruit they want at any corner. But you cannot do this anywhere except on the banks of the Mediterranean, and even there you miss some favorites. English people are sometimes very boastful about their fruit, and when we taste the apples, pears, cherries and plums which have grown on the sunny side of some wall as carefully shielded and tended as people in Manitoba would tend peaches, we appreciate how delicious they are; but the trouble is that comparatively few such fruits can be raised in Great Britain—not nearly enough to supply the demand, even at the high price the owners are compelled to charge. Some small fruits, however, are numerous and delicious, strawberries, for instance, and gooseberries—no American or Canadian ever knows what gooseberries are capable of until he has tasted the English ones.

All over North America apples are so numerous and cheap that often thousands of bushels are allowed to fall to the ground and rot, because the owner of the orchard cannot sell them

CONTINUED FROM 423

for enough to pay for picking them. In the meanwhile, perhaps, city markets not far away have been fully supplied with apples that have come from farther away in the other direction. This is due to the schemes of the larger buyers and dealers, who will gather their stock where they can do it to most profit, with little regard to the orchardist. Lately the city markets all over the country have offered very large, shining, red apples that come all the way from the valley of the Columbia River, where a large association of growers not only raise this big, beautiful fruit successfully, but have powerful arrangements for sending the crop all over the country.

Peaches are almost as common and cheap as apples in this country, and the largest supply for the East comes from Georgia in the South, and from Michigan and southern Canada in the North; but they are grown almost everywhere, and most of the fine canned peaches that we buy in the shops come from California. Apricots and nectarines come mainly from the southwest and Pacific Coast. The West also supplies us with immense quantities of melons.

The large size and fine appearance of the fruit grown on the Pacific Coast and sent to the middle and eastern states have caused it to rival that grown nearer home, and it may be

bought in almost every town in the United States and Canada as cheaply as good home-grown fruit. This is because it is handled in large quantities in a very business-like way, and because it comes to market earlier than most of the eastern fruit.

WHERE OUR ORANGES AND BANANAS COME FROM

Most of the oranges eaten in the United States are grown in Florida and Southern California. Oranges from Florida are usually very juicy, while the large navel oranges are mostly grown in California. Whole train loads from these states are sent out at one time, and distributed all over the continent. We also get great quantities of oranges from Cuba, Porto Rico, Jamaica and other West Indian islands. Small oranges, later in the season, come from the Mediterranean—especially from Spain and Italy; and it is from this region that England gets most of its supply. Lemons are also raised extensively in California and the West Indies, and sent all over the country; but the greater part of our enormous supply of this fruit is brought to us from Sicily and Southern Italy. Oranges and lemons also come from Palestine.

Another delicious fruit with which Florida and California keep us supplied is the grape fruit, which is grown in large quantities in both states. It also grows in the West Indies and in Mexico; but its original home is in the Pacific islands. It is known also as the pomelo, and two varieties—one of which has crimson flesh—are called the shaddock. These are more often grown in Jamaica. The grape fruit belongs to the same family as the orange, and is cultivated in the same way. Its large, yellow balls often grow in grape-like clusters, and it is from this fact that it gets its name. This fruit reaches its greatest perfection in Florida.

Florida also gives us the little kumquat, another relative of the orange family. It makes a delicious salad, and as the skin is sweet, skin and pulp are both eaten. The plant is small and is often grown in pots.

One of the things we cannot grow, even in California, is the banana, and not very long ago this tropical fruit was a luxury hardly known outside of eastern and southern seaports; but now it is common and cheap all over the country. Bananas come to us by the ship load from

Cuba and the other West Indies; but mainly from Central America, especially Southern Mexico (Yucatan), Guatemala, Nicaragua and Costa Rica. Not only do the people of those countries produce them in large quantities, but many farmers from the United States and Canada have settled in those places, and planted great fields of bananas of various kinds, as well as orange and lemon groves, coffee groves and plantations of pineapples, for sale to us. Jamaica has very extensive plantations, but most of its product goes to England and other countries of Europe.

The pineapple is another delicious tropical fruit which has come into common use. Florida produces a great quantity, and is yielding more and more; so does Southern California and Mexico. The greater part of our supply, however, is derived from the shores and islands of the Caribbean Sea, and is brought to us in the fruit steamers, dozens of which, all very swift and built especially for this trade, ply back and forth between the tropics and our northern ports. Large quantities of pineapples are also grown in Hawaii and some of the best of our canned supply of the fruit comes from these islands.

WHERE GRAPES AND OLIVES GROW IN LARGE QUANTITIES

Grapes grow in all temperate countries, and in parts of the United States and the south of Canada vast vineyards exist, so that we have no need to import table grapes. Yet there is one sort, the large, greenish-white, fleshy grape, called the Malaga, from a town in Spain, which we bring in great quantities in the autumn from the Mediterranean countries. Even this importation has lessened, however, because large vineyards of these are being grown in California. California also grows an immense amount of raisin grapes, which are made into excellent raisins, so that we no longer need to depend on Southern Europe for raisins. Greece and the Levantine countries still send us, however, all the "Zante currants" we use, which are not really currants, but small dried grapes. Europe gets all its raisins from Spain, Greece and Turkey.

Olives have been grown in California since the Jesuit Fathers first planted them in the garden of San Diego Mission. There are many olive groves now in that state, and it sends us stuffed and pickled

HOW THE ORANGES AND LEMONS GROW



Almost all our oranges come from the warm parts of California and from Florida, where they grow freely. This is an orange-grove in California. The original home of the orange was in Asia—perhaps in China.

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A Spanish girl picking ripe oranges in the South of Spain. The famous bitter oranges for marmalade come from Seville, in Spain. Scents, as well as marmalade, are made from the fruit of the orange.

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This is an orange-grove in Florida. The country grows so many flowers and fruits that it deserves its name, which means, "Land of Flowers." Sometimes frost comes. As the orange cannot grow in frost, the farmer lights oil-fires in his orchards, and the smoke forms a blanket round the trees and keeps frost away.



The blossom of the orange in Florida. The orange forms in the centre of the blossom. Then the petals fall, and the fruit uses the strength of the plant.

Copyright, 1907, by H. C. White Co.



Lemons are growing here. They need the same sort of climate as the orange. Though always sour, they make pleasant drinks, medicine, and scent.

Copyright, 1901, by H. C. White Co.

olives in attractive-looking glass bottles, ripe black olives, and some of our best olive oil.

We in this country know nothing of fresh dates. Dried, they come to us from Egypt and other parts of Africa. To us the date is a luxury; to people in the East, it is their food and the principal part of their wealth. A tree begins to bear fruit when eight years old. It is at its best when thirty years old, but if properly treated it shows no weakness till over one hundred. It is meat and drink in the East.

WHERE THE FIG GROWS AND HOW THE PRUNE IS MADE

At one time, although figs were grown in many of the southern states, and especially in Florida and California, we were dependent on the Mediterranean countries for almost the whole of our supply of this fruit. Lately, however, fig growing has increased in California, and large quantities are dried and canned in that state every year. The Smyrna fig has been introduced into California, and now reaches its full perfection there. California and Florida also grow guavas and mangoes.

Few of us, as we eat some plump, juicy prunes for breakfast, or a delicious prune whip for dessert, are aware that the state of California produces more prunes than any other country. They are also grown in British Columbia, and in Washington, Oregon and Idaho. As we know, prunes are dried plums, but all plums will not make prunes. Three varieties, commonly called the petite, the Italian and the silver prunes, have been found best for this purpose and hundreds of acres of these plums are grown. The fruit is allowed to become very ripe, and then picked, dipped for a minute into boiling lye to soften the skin, carefully washed, and dried in the sun, or in an evaporator.

Among our small fruits, we have several varieties of blueberries and huckleberries. Some of them grow in low, swampy ground, some on dry, hard soil, and others again on the rocky ground of the mountain side. These delicious fruits grow wild in such large quantities and in so many places that very small effort has been made to cultivate them, and most of the berries that we find on the markets have been picked in the woods and sent to the cities from long distances. Of late years, in New Brunswick and in New

Hampshire, the "wild" blueberry fields have been carefully looked after. Canneries have been built close to these fields, large quantities of the fruit are preserved on the spot, and a flourishing industry is growing up in what might otherwise be waste places. The Department of Agriculture in several places has made experiments and has found that improved varieties can be made to grow on ground which is fit for little else. Most of the blueberries are large and juicy, with a lovely blue bloom, and no more delicious fruit can be found. The huckleberry fruit is of a jet black color, and one variety has gritty little three-cornered seeds which make it less agreeable for eating. Blueberries and huckleberries both belong to the heath family.

THE CRANBERRY, FRUIT OF THE MARSHLANDS OF THE NORTH

A close relative of these fruits is the cranberry, the rich red berry dear to our hearts at Thanksgiving and Christmas time. For this berry we are indebted to several provinces of Canada and the New England states, Michigan and Wisconsin. The cranberry that we know in this country grows only in North America, and it is only in North America that the cranberry is cultivated, so that we may truly call it a national fruit. Its cultivation was first begun on Cape Cod, and the marshes of that region are largely given over to its growth. It grows best on low, peaty ground. The plants are flooded during the winter season, but the bogs are drained in April. The fruit is picked in September and October and packed in barrels, and will keep for a long time. Large quantities are now exported, especially to France and the British Isles.

The southern states also give us melons by the tens of thousands, and strawberries. Thousands of acres are devoted to these crops all the way from Virginia to Alabama; and thousands of people are employed in cultivating them, and especially in picking them for northern markets. Large quantities of both these fruits are also grown in the north, and when the southern crop is almost over the northern crop begins to ripen.

There is nothing, indeed, in which this continent is more fortunate than in its ability to grow a great variety of fruit, and to get it to the people in all parts of the country, fresh and cheap.

THE NEXT STORY OF FAMILIAR THINGS IS ON PAGE 703.

WHERE THE BANANAS COME FROM

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The shopkeeper in America carefully guards his store of bananas, but here we see how little trouble is taken over the banana as it grows in Jamaica.



A fine growth of bananas in the Hawaiian Islands. They must be cut before they ripen, for they would spoil if packed when soft and ready for eating.



We do not think of black men when we eat bananas, but black men grow them. Here are some black people in Jamaica carrying the banana to market.

Copyright by Underwood & Underwood.



Cuban natives are here bringing their bananas for sale. Then the fruit will be stored in a ship and sent to America, to be sold at about two cents each.

GATHERING THE PINEAPPLES FOR MARKET

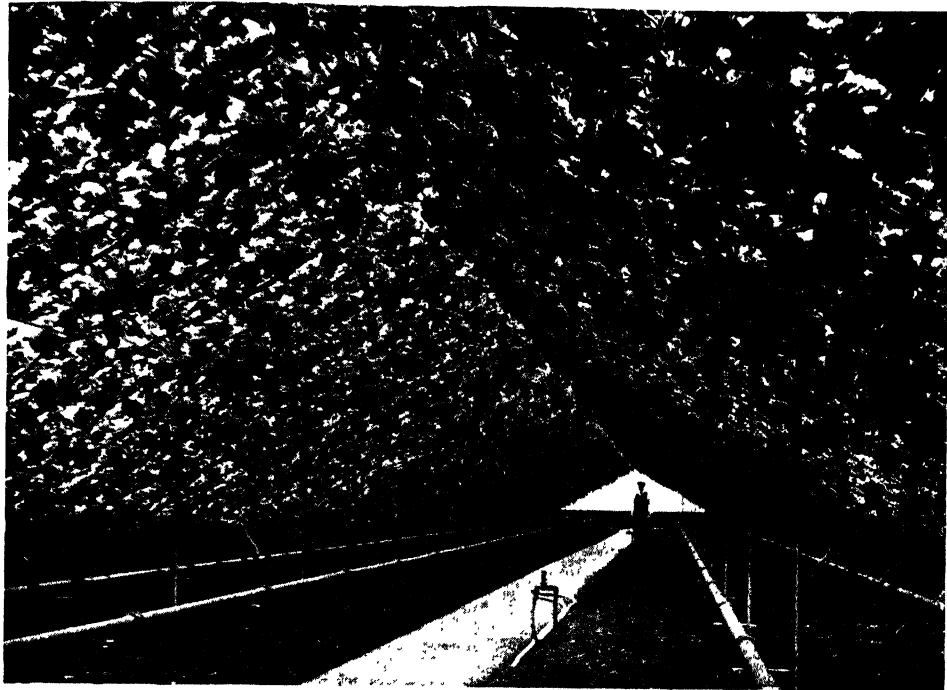


A field of pineapples in Florida. The pineapple loves warmth, but it must have moisture. Only one fruit grows upon the cultivated plant, but from the tuft of leaves at the top another pineapple might be grown



In this picture we can see the harvesters gathering the pineapples ready to send to the market. The pickers have to be most careful, for the great broad leaves which we see have points as sharp as spears and edges like swords. Careless pickers invariably pay for their carelessness with badly cut hands and arms. Photographs copyright by B. L. Singley.

GRAPES IN A VINERY, BLUEBERRIES OUT OF DOORS



This picture shows us how grapes are grown in countries where they will not ripen out of doors. A few very fine grapes are grown in vineries in some parts of the United States, but they are seldom found in our markets. Grapes like these which we used to see in the fruitshops came from Belgium.



All the blueberries that we buy come from wild bushes. In some places the blueberry fields are "burned over" every three years, but most of them do not even receive this attention. Blueberries, however, will repay cultivation in peaty ground, as we may see from these pictures of plants grown under the direction of the United States Department of Agriculture, on a farm in New Jersey.

HOW WE GATHER THE FIGS AND DATES



The picture shows us date-palms like those of which we read in the Bible. The date is of great importance to the people of Egypt and other Eastern countries, as it is their principal food. A good tree gives from 300 to 600 pounds in a year, and from the time it is thirty until it is one hundred years old.



Figs grow in some parts of America, but not to such perfection as these seen here, which are growing at Teneriffe, in the Canary Islands. The fig first grew in the East, but plants have been taken to many warm lands, and the fruit, whether eaten ripe or after being dried, is good and pleasant. The Austrians are said to sometimes mix figs with their coffee, which is supposed to be the best flavored in the world.



This is a picture of an apple-tree in blossom. Each of these blossoms will become an apple, if the weather be favorable. The wind and the insects will carry pollen from flower to flower to make the apple grow. The petals will drop off, and in their place the tiny fruit will form, which will ripen in autumn.

The photographs in these pages are by the Photochrome Co., Underwood & Underwood, Keystone View Co., H. C. White Co., H. Irving, T. Seymour, C. P. Cassette, E. Tyler, and others.

THE LIFE-STORY OF AN APPLE IN PICTURES



On this page we have the life-story of the apple. First we see the bud, which, until it opens, can defy frost. Then, when warm weather comes, we see the handsome pink blossom waiting to catch the pollen.



The pollen has been brought, and some morning we find that the blossom has gone, and in the place of it we find a little green pellet, and if we watch this we shall see it grow into what the next picture shows.



Spring and summer have come and gone, and autumn is beginning; and here is the apple, ripe and sweet. There are two thousand sorts of apples, but though Europe and England and New Zealand grow very good kinds, no other apple is quite so fine-flavored and thin-skinned as our native apple.

PEACHES, PLUMS, & MELONS, AS THEY GROW



The delicious plum grows best on English soil, though France, Germany, and our own country grow fine ones. The plum makes good jam, which cannot be said of apples and pears which are much less juicy.



Peaches grow freely throughout the United States, and in parts of Canada. They came originally from Asia, and have been known for many centuries in China, where some people think they first grew.



Musk-melons, or cantaloupes, grow freely in the United States and parts of Canada. In England the climate is so much colder that they must be grown in hothouses, as shown in the above picture.

SOME FRUITS OF AN AMERICAN GARDEN



Here we see a bunch of white currants. These grow in our gardens, though they are not so plentiful as the red and black kinds. Several varieties of blackberries grow wild in this country, and some of these are cultivated. Those shown are common in the British Isles. This is a picture of a bunch of black currants. The "currants" really small dried red grapes.



Here is the gooseberry, which is common throughout Northern Europe and America. The best are English, and grow, not in Kent, where most of the fruit comes from, but in Lancashire.

These are cultivated raspberries. The wild ones are rather smaller, but they have a delicious flavor.



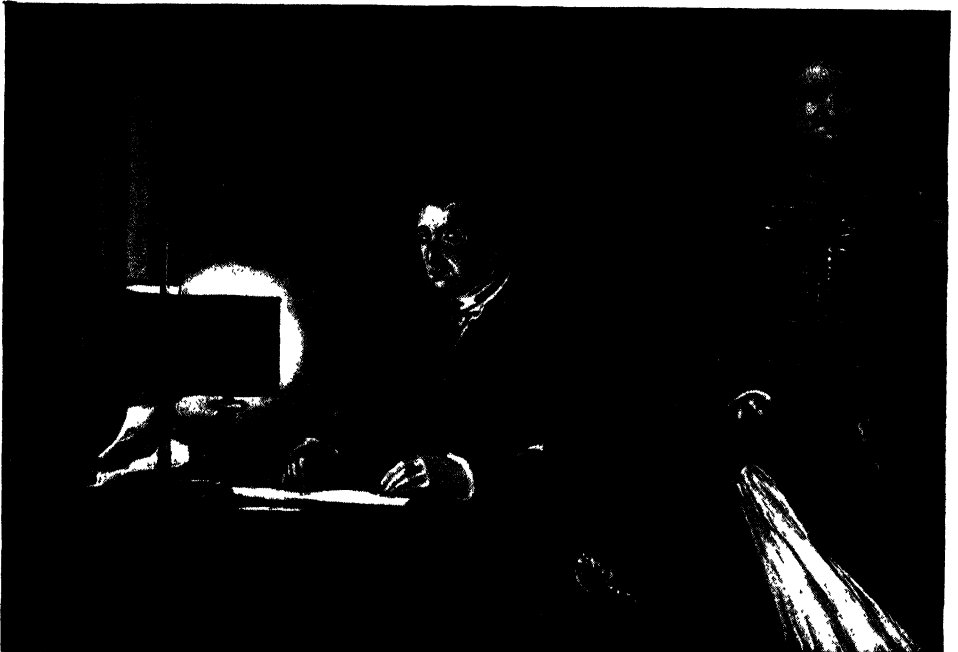
The English pear is the best in the world. In the western countries many men grow little besides pears and apples. Pears make a drink called perry. Here are cherries, which grow in nearly all western countries. We eat the cherry as dessert, and preserve it, but Germans use it in their soup.

THE NEXT PICTURES OF FAMILIAR THINGS ARE ON PAGE 703.

THE DREAMER IN THE DIM LIGHT OF THE WORLD



This is the picture of an inventor thinking out problems long ago. All through the ages there have been dreamers who have looked forward into time and sought to make the world better; and it is such men who have enabled us to have as much light as we like, so that the poorest in these days has in his cottage a treasure which princes could not enjoy in their palaces long ago.



THE DUKE OF WELLINGTON WRITING BY CANDLE-LIGHT

In this picture we see the Duke of Wellington writing his despatches from the wars in the dim light of a candle. He was one of the most famous men in the world, yet when night came he could command no better light than this. For thousands of years kings' palaces were lit up with candles or oil-lamps.

The Book of MEN & WOMEN

WHAT THIS STORY TELLS US

NOW that men have conquered darkness so that we can fill a place with light by turning a tap, it is hard to imagine what it must have been like to live before men found out how to make light. To-day a child can fill a dark room with light by touching a switch or turning a tap; but even a king could not have done that a hundred years ago. The men who began to light the world with gas were laughed at as if they were idle dreamers, and even wise men declared that lighting houses and towns by gas was a mad idea. But the men plodded on, as all the inventors did, fighting against ignorance and superstition, and they won the day. It is one of the most hopeful signs in the world when the world laughs at you, and we can never pay the debt we owe to the men who struggled hard to benefit the world while those who looked on laughed.

THE MEN WHO GAVE US LIGHT

"If you please, will you give me some fire?"

What would you think if somebody came to the door and said that? It would sound strange indeed to you; but your grandparents must have heard it often. Think of a place in which gas is not used, where there is no electric light, where there are no matches, then you get an idea of what things were like when your grandfather was a little boy. He will remember when the servant had to burn old rag overnight to make tinder for the morning; how, before it was light, she would have to get up and strike a piece of iron on a piece of flint and make sparks fly from it, to set light to the tinder, so that something else could be lighted from it. If the tinder were damp or the flint old, then there was nothing for it but to go next door and borrow some fire. Some persons still remember this.

How do you think we first got fire and light? Nobody really knows; but it is supposed that men, ages and ages ago, first found that sticks would burn if dropped into some hole where melted lava from a volcano lay boiling. Or they may have seen trees catch fire through being struck by lightning. Men learned that by rubbing two pieces of wood together they could cause them to catch fire, and for thousands of years that was the way in

CONTINUED FROM PAGE 605



which they set light to their wood. Savages in many parts of the world still do

this; but, as wet wood cannot be made to light in this way, they keep fires always burning where the forests are damp, or, at any rate, during the rainy season. Striking fire from flint came a very long time after the rubbing of wood, for during thousands of years men did not know how to get and use iron.

When they got used to making fires with which to cook their food and to keep themselves warm at nights, they found that certain resins or gums from trees would burn with a bright flame and last longer than wood alone. So they would melt the resin and dip twigs into it, and so make torches, which would serve to light their homes at night. This sort of light had to serve for ages. In fact, the iron stands in which torches used to be fixed are still to be seen in old houses.

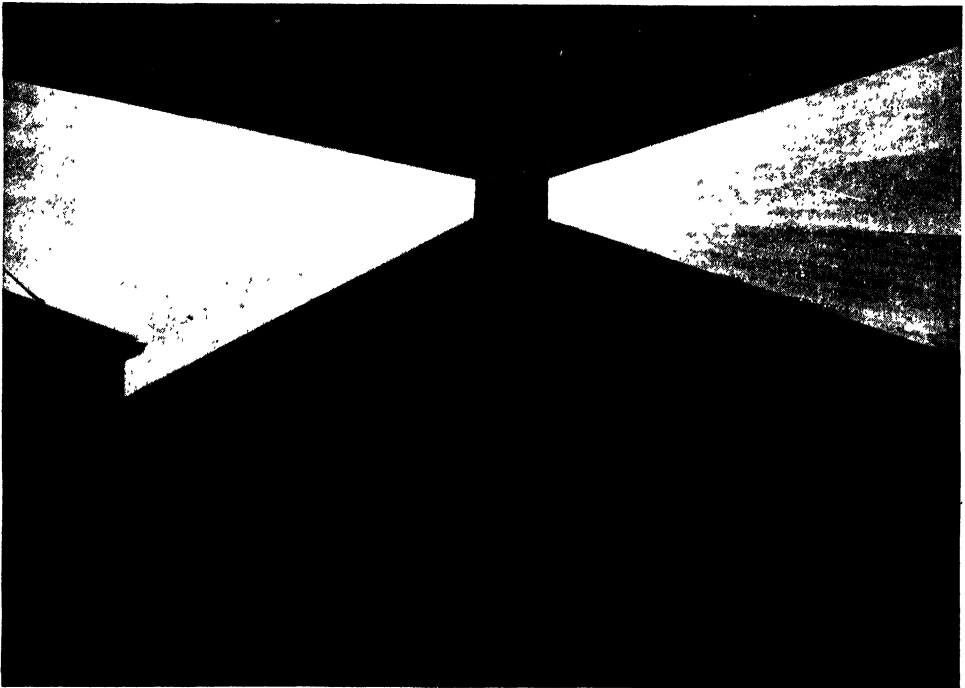
We had no gas in American streets, nor, indeed, in any streets in the world, when the nineteenth century came in. Boys ran about the towns at night carrying torches, or links, as they were called, and if you wanted to go to a friend's house after daylight had gone you had to hire a link-boy to light the way or else risk losing your life.

Napoleon and Washington never saw a gas-lamp. In their day the

THE BOY WHO FOUND ELECTRIC LIGHT



Electricity has changed the face of the world. It drives our trains and trolleys; it carries water hundreds of miles; it enables us to have light where light could never have been before. The first of these pictures shows us the boy who gave us electric light, Humphry Davy. He was apprenticed to a chemist and began experimenting with light when he was a boy, though he laughed at the idea of lighting by gas. He made the safety-lamp that is used in some coal-mines to-day, and he gave us the first electric light.



This great light comes from a wonderful lamp such as is used in lighthouses to warn sailors of dangerous rocks. When Sir Humphry Davy first began thinking about light, as we see him in the first picture, he had only a candle or an oil-lamp to work by at night; but this lighthouse lamp, shining with the electric light that he discovered, gives a light over the sea equal to the power of 15,000,000 candles.

best lights were candles and miserable little oil-lamps, just as men had had for hundreds of years before. When you read about the past splendors and marvels of the palaces of the East, or of the luxury and delight of the great baronial halls of England, you must remember that these places were gloomy and murky at night, with their smoky lamps and dim candles or torches. When you read of the great speeches made by Patrick Henry, or Daniel Webster, you must remember that, if those speeches were made after dark, the buildings in which they were made had to be lighted up by candles. When King William the Fourth was making a speech to the House of Commons, he had to stop, because it was too dark for him to read, and he waited until candles were brought in.

Yet there was gas to be had then as there is now, if men had but known how to get it.

A GREAT BLAZE OF LIGHT THAT SET A CLEVER MAN THINKING

In a coal-mine at Whitehaven, gas used to escape from the coal into the pit. This gas, catching fire, produced a flame a yard wide and two yards long. The gas kept escaping, so the flame continued to burn, and the miners did not know how to put it out. What they did was to build up brickwork round the flame, then put in a metal tube, which they carried to the top of the pit. The gas rushed through this tube and burnt high in the air over the mouth of the mine, and there it burnt for a long time and at night lighted up the country around.

The story of this was printed in 1733, and it set a clever man, called Dr. Clayton, thinking; for in 1737 he began to try experiments with coal-gas. He did not quite know what it was, so he called it "the spirit of coal." He used to burn coal in a retort and catch the gas in bladders. Then to amuse his friends he would prick a hole in the bladder, and, putting the hole near a lighted candle, would startle everybody by letting the gas blaze away until none of it was left. Dr. Clayton had really gone so far towards making coal-gas that he ought to have gone further and made a success of his invention; but he did not know how great a discovery he had made, and

nothing serious was done with gas for over fifty years.

One day, in 1777, a young Scotsman walked into the office of Messrs. Boulton and Watt, the steam-engine makers of Soho, Birmingham, and asked for work. He was so nervous when answering Mr. Boulton's questions that he let his hat drop to the ground. The hat made such a noise on touching the floor that Mr. Boulton was surprised, and asked the reason. The young man explained that the hat was a wooden one, which he himself had made on his father's lathe. Mr. Boulton thought that any one who could do this was no ordinary man, and forthwith engaged him.

THE YOUNG SCOTSMAN WITH A WOODEN HAT, WHO INVENTED GAS-LIGHT

That young man was William Murdock, the inventor of coal-gas. His name really was "Murdock," but as English people could not pronounce the name in the Scottish way he changed it to Murdock, so that it should be spelt as they pronounced it. He was born in 1754, at Old Cumnock, Ayrshire, and is the same William Murdock of whom you read in the story of the men who made the railways on page 600.

Murdock proved a very clever man. He had a wonderful brain, and was always inventing things, some of which were of much importance. But he was so modest that he never cared for these things for his own sake; he wished his employers to get the credit for what he did, and his fellow-men to enjoy the benefit. As Murdock was so good a workman, Boulton and Watt sent him into Cornwall, where they built engines. He lived in a cottage at Redruth.

HOW THE GAS-MAN FRIGHTENED THE VILLAGE BY NIGHT

Here it was that he made his model steam locomotive. He had a funny adventure with it. He set it going on the road late one night, without having tried it before, except in his own room. When the little engine got up steam, it raced away from its maker. Murdock had had no idea that it would go so fast. It soon disappeared, and he heard cries of terror in the distance. Murdock ran as fast as he could, and found that the cries came from the lips of the village clergyman, who, seeing the little engine, hissing and aglow with fire, had taken it to be some terrible monster.

Now, the making of gas filled Murdock's mind. Other people knew that it existed, but he was the first man to think out what could be done with it. He made all sorts of trials in secret at his little house, and the boys of Redruth, who knew that this quiet Scotsman was very clever, used to creep softly about outside his house, badly wanting to look in to see what he was doing.

THE BOY WHO BOUGHT A THIMBLE AND SAW IT LIT WITH GAS

It is said that one day Murdock came out and saw several of the boys standing there. He called one, William Symonds, and sent him to the shop near by for a thimble. William ran there and back, but he wanted to go into the house to see what that thimble was for. So when he got to the door he pretended to be fumbling for the thimble.

Murdock let him go into the house to find it, and then closed the door behind him. Murdock had a kettle filled with coal; he had burned the coal and caused the gas to be driven into a large metal case, such as they used for blasting. In this he had fixed a metal tube. On the end of this he now fastened the thimble, in which he first made one or two small holes. Then he let the gas escape through the tube and thimble, and set light to it. Of course, the gas blazed merrily, and so young William Symonds saw the discoverer of the use of coal-gas make his first trial with gas.

After this, Murdock used to fill bladders with gas, fix a metal tube in the neck, light the gas which came through it, and use it as a lantern to light him about at nights. You will not be surprized to hear that the simple people of Redruth thought he was a wizard.

THE LITTLE COTTAGE IN CORNWALL WHICH WAS FIRST LIGHTED BY GAS

There is some doubt when the first house was lighted by gas. In 1892 a great many people rejoiced because they believed that year to be the hundredth anniversary of gas-lighting; but they seem to have been wrong in their date, for the year was probably either 1794 or 1795. In one of those years—it does not matter very much which—Murdock is said to have made enough gas to light his house. The gas was made in his little garden, then carried by a pipe through a hole made in the window-frame to a position near the ceiling.

And there, in that poor Scotsman's little cottage, far away in a Cornish village, gas was first lighted.

When he had succeeded here, Murdock fitted up pipes and made gas and lighted up his employers' premises at Soho. That was in 1802, when all the place was lit up to show how glad everybody was that the war between England and France had come to an end.

People did not know what this gas-light was. The retort containing the gas was placed in the fireplace; a pipe ran to the outside of the workshop, and there the gas blazed in two copper vases. That was the first public display of gas-lighting, and people thought it was only some new sort of fireworks.

Murdock's employers were so pleased with the light that in 1803 they had part of their factory at Soho lighted up with gas, and after that other people, seeing how bright it was, how much cleaner and cheaper than lamps and candles, wanted to have their premises lighted in the same way. A Manchester cotton-mill was the next to be lighted with gas, and Murdock fitted up the pipes and burners and had them burning by New Year's Day, 1806.

THE MAN WHO MADE THE GAS-LIGHT AND THE MEN WHO MADE THE MONEY

Up to the time when he lighted up his own house with gas, Murdock was paid \$5 a week. When he was called back to Soho, the mine-owners of Cornwall begged him not to go, saying, "We will give you twenty pounds a week to stay." But Murdock was too faithful a servant to heed this. He went to Soho, and in the end he had a salary there similar to that which his admirers in Cornwall had offered him. But he never made any money out of gas-lighting.

Gas-lighting was taken up by a German in London, named Winsor. This man wanted Parliament to make everybody in the country burn gas, and to give the company which he was forming the right to make the gas and fit up all the streets and houses with pipes and burners. The profits would be so great, he said, that he would be able to give the State great sums, and make all who lent him money for the beginning of the work very rich indeed. He failed then to get the consent of Parliament, but in 1810

a company was formed which began the lighting of London by gas.

It was not at first successful. People did not believe in gas. Sir Humphry Davy, a very great man, did not believe in it. "To get all the gas you want you will need the dome of St. Paul's Cathedral for a gas-holder, and that will explode," he said. Sir Walter Scott said, "There is a madman in London proposing to light London with—what do you think?—*smoke!*" He did not understand it any better than the most ignorant of men, yet, in later years, he had gas-pipes fitted up at his own house, and found what a splendid thing it was. Winsor did good work by persevering till he got the first company formed.

HOW THE GREAT GAS MYSTERY PUZZLED THE PEOPLE IN THE STREETS

In 1813 Westminster Bridge was lighted up by gas. How the people wondered! They thought that the flame which they saw came through the pipes. They could not understand that the gas came through the pipes, and was lit at the burner; they imagined that there was a roaring flame inside the pipes, and that the lamp-lighters simply turned a tap and let out the flame.

When at last gas was introduced into the House of Commons, people thought the pipes would be so hot that they would burn the building, so they had the pipes fixed far away from the walls, lest the building should be set on fire. Members of Parliament used to put on their gloves to escape being burnt, then go and feel the pipes, to see if they were hot. They could hardly believe their senses when they found that the pipes were cold.

THE GREAT IMPROVEMENT THAT HAS TAKEN PLACE IN GAS-LIGHT

The first American to light his house by gas was David Melville of Newport, R.I. Baltimore was lighted in 1817, and Glasgow the same year. Liverpool and Dublin in 1818, and other towns, big and little, soon followed. Murdock made no profit out of it, but the honor of the discovery was his, and he did not mind. He made as much money as he wanted at other work, and was quite well off. He will always be honored as one of the best and cleverest of men, and as modest as he was skilful.

Since that time gas-lighting has greatly improved. All sorts of burners have

been invented to make the light better. The most important improvement is the incandescent light. This light requires the use of a "mantle," of which many sorts are made. The effect of using one is to cause the mantle to glow and become a brilliant white, so powerful that one such flame will give a light as strong as if the flames from nearly 300 candles were all burning at the same time.

As everybody knows, gas has a strong rival in the electric light. A few years ago, until incandescent gas became general, it seemed as if the electric light would do away with gas. Many men have helped to bring the electric light to its present state of usefulness, and many more will help before it attains perfection. We owe the discovery of it to Sir Humphry Davy.

THE CHEMIST'S APPRENTICE WHO MADE THE FIRST ELECTRIC LIGHT

Born at Penzance, in 1778, he was only a poor apprentice to a little country chemist when he began his career; but he was so clever, and studied so hard, that he became the most eminent scientist of his day. It was when he had become famous that he began his experiments in electricity.

He had a great electric battery, to which he joined two wires. When their ends touched each other, nothing happened; but when the two ends were drawn just a tiny way apart a light appeared. But it was so hot that it burnt the wires, so Davy fastened two pieces of charcoal on the ends, and thus was able to make a splendid light.

What really happened was this: When the current of electricity was turned on, if the ends of the wires were together, the current ran from one to the other without a break. If the wires were separated, but held near each other, the current rushed to the end of one wire, and, on reaching the charcoal, leapt over with such force to the other piece of charcoal that it carried tiny fragments of the first piece of charcoal with it. These fragments formed a sort of bridge for the electric current from one mass of charcoal to the other. But the air resisted the passage of the current so much that the bridge of charcoal was made white hot, and so gave this brilliant light. That was the first discovery that electricity would give light, and it was made known by Davy a few

years before his death, which took place in 1829.

The great electric arc-lamps which you see in the streets and at railway stations are no more than electricity conducted along a wire to a pencil of carbon, from which it leaps to the end of another piece of carbon, and in its leap causes a great white flame of fearful heat to burn. Of course, the carbon which carries the current soon gets burnt away, while that which receives the current from the first does not.

A LAMP THAT KEEPS OUT THE AIR FOR THE LIGHT TO BURN BRIGHTLY

To make things equal, we now have what are called alternating currents—that is to say, suppose the current is brought by the carbon which reaches from the bottom up to the centre of the lamp, we next change about, and have the current brought in by the stick of carbon which reaches down from the top to the centre of the lamp. In that way they will burn away equally.

The great mischief with this sort of lamp is that, as the flame is exposed to the air, it is made to burn so fiercely. Therefore, until we could get rid of the air in the lamp, it was useless to hope for little lamps for the house. What we needed was a lamp with a vacuum. A vacuum is a space in which there is no air, or so little as hardly to be noticeable, for it is impossible to get a complete vacuum. The first men to find the way to make the small glow-lamp were Joseph Wilson Swan—who was born at Sunderland in 1828—and Thomas Alva Edison, the famous American inventor, who was born in 1847. Mr. Edison was very poor as a boy, and used to sell newspapers, but he has given the world some of its most wonderful inventions.

THOMAS ALVA EDISON AND HIS WONDERFUL LAMP

The difficulty was to get some material in the lamp which would take the place of the sticks of carbon in the arc-lamp. At first a very costly metal, called platinum, was tried. That was all very well while it lasted, but it soon burned away, and it was too costly—few people would have been able to buy the lamp. Mr. Edison baked strips of bamboo till they became carbon, while Mr. Swan

soaked threads of cotton in acid, and then baked them. After much experimenting a satisfactory method was at last found. Recently lamps have been made with filaments of certain rare metals, such as tungsten, which cost more than the ordinary kind but give a brighter light. The filament which you see carrying the flame in the bulb has to be connected with wires which run through the neck of the lamp, and are connected with the wires which carry the current to the lamp.

Now, heat causes things to expand. When the electric current enters the lamp, it causes the glass rapidly to expand. If the wires running through the neck of the lamp did not swell just as quickly, a space round them would open and let the air rush through, destroy the vacuum, and spoil the lamp. Platinum expands very rapidly under heat, so, though it is too costly to use for the filament of the lamp, it is used to join on to the filament.

THE POOR MAN'S TREASURE WHICH ONCE KINGS COULD NOT BUY

While all these fittings are being put in, the glass bulb of the lamp is open at the bottom. Now the lamp is put into a wonderful machine, which sucks all the air out of the lamp. The glass is made very hot and soft, and the lamp is then sealed up at the bottom. The little nob at the end of the bulb is the point at which the glass is closed up when the air has been drawn away.

The lamps which many of our light-houses use are arc-lamps, the great, powerful lamps which send their light far and near over the sea, and warn the sailors of dangerous rocks and shoals. The light known as Barnegat light, off New Jersey, has a light which is said to equal the power of 30,000,000 candles.

All this has happened in a hundred years. A century ago even kings had miserable oil-lamps or dim candles to light up their homes, and the picture on page 662 shows the great Duke of Wellington writing his despatches by the dim light of a candle. To-day even poor people can afford to have their homes lighted by gas or electricity if they live in a town which has gas works or an electric plant.

THE OIL LAMP THAT LIGHTS THE COUNTRY HOME

But we must not forget that many people live in the country, outside of towns and villages, or in villages where there is no possibility of having either gas or electricity. Nevertheless, the poorest of these homes can be brightly illuminated and made cheerful by the light of such lamps as kings would have paid a ransom for in the old days.

The use of oil lamps is such an old story that no one can tell who first thought of them. The oldest oil lamp that has been found is at least six thousand years old. It was made from a conch shell, and was probably used to keep a light burning in an ancient temple. By and by, lamps were made of stone and later of clay, and later still of iron or bronze, but they were all merely open receptacles to hold a little oil, on which floated a rude wick, supported by a spout. After centuries had passed, men learned to cover the top of the lamp, except for the spout and a small hole through which to pour the oil, and this was an improvement, but at their best, the lamps were only primitive affairs. The wicks were improved, however, by being specially woven, and in the eighteenth century some one thought of using a flat wick, which could be held in a burner. But even this was not satisfactory, for the air was not able to reach the middle of the thick wick, and the flame was poor and smoky.

AIME ARGAND, WHO MADE THE FIRST GOOD LAMP

Hitherto men of science had not taken much interest in lamps, but in 1781 a learned Swiss named Aimé Argand turned his mind to the subject. Aimé Argand, who was born in Geneva in 1755, became a mathematician. He was much troubled by the poor light by which he had to study in the long winter evenings, and in 1781 he determined to make a lamp which should not be smoky, or ill-smelling, and which would give a good, steady light. After much thought, he had a circular wick woven, which would fit over a brass cylinder in his lamp, and could be moved up and down. He allowed air to come through this cylinder from beneath, and this supplied the inside of the wick with oxygen.

His wick and cylinder worked smoothly, but with all his efforts he

could not make the flame burn brightly until at last his young brother, who was watching him, picked up a broken flask, fitted it over the flame, and immediately the lamp gave a clear, steady light. This was the first use of a lamp chimney, and was one of the greatest discoveries ever made in lighting. Argand's lamp, which he had manufactured in England in 1782, was a great success, and paved the way for many improvements, but he died in poverty in 1803. It was nearly fifty years after his death before a really good illumination could be obtained from oil, but the fault was now in the oil burned in the lamps.

THE OIL WE USE FOR FUEL IN OUR LAMPS

The oil burned in early days came from olives; the fat of animals was used and, curiously enough, even in very ancient times, people in some parts of Asia and Europe used the petroleum which they found oozing from the ground in the neighborhood of springs, and in later years sperm oil, taken from the bodies of whales, was used. This oil was also used by well-to-do people in this country, and so was colza oil, made from rape seed, and in some places lamps were made which burned lard.

In 1848, Samuel M. Kier put on sale, as illuminating oil, a stock of "carbon oil" which he could not sell as medicine; in 1846 Abraham Gesner, a Nova Scotian, began to distil oil from coal; in 1850, James Young, a Scotchman, made a good oil from shale; a year or two later Warren de la Rue invented, in England, a new process for refining mineral oil or petroleum, and, in 1859, Edwin L. Drake drilled the first Pennsylvania oil well. You may read of these men in the story of "How We Get Kerosene."

Soon many wells were in operation. Oil became abundant, and better means of refining it were invented. Better lamps were also made, and now we use improved Argand lamps, student lamps, lamps which burn brightly enough to be used as locomotive head lights, lamps which are supplied with air by clock work, lamps with circular wicks, lamps with large single wicks, duplex lamps with double burners, lamps on which a Welsbach mantle can be used, and the little hand lamp of glass or metal which is seen in every corner of the globe.

THE NEXT STORY OF MEN AND WOMEN IS ON PAGE 761.

THE ANIMAL LADDER OF LIFE



All living creatures had their far-off beginnings at the bottom of the ocean. This picture makes clear the later steps in the ladder of life—the steps taken since the making of the backbone, which the first creatures had not. The oldest backboned creatures are the fishes. Above them are animals that live on land and in water. Then there is a split. On the one side the land-and-water animals gave rise to the reptiles, and these gave rise to the birds. On the other side, the land-and-water animals gave rise to the mammals.

The Book of OUR OWN LIFE

WHAT THIS STORY TELLS US

WE read here of the way in which life became clothed—that is, of the making of the body. The first animals were never able to do much in the world, for two reasons. They lived in the sea and could not get enough oxygen, and they had no backbone, and no animal without a backbone has ever been of much importance. The backbone is the chief factor in the making of our bodies, and in these pages we learn to divide animals into two great classes—those that have a backbone and those that have not. The earliest backboned creatures are the fishes. Above them are animals that live on land or in water, such as the frog, which is born a fish and becomes a reptile. From these, the evolutionist tells us, came two great branches—on one side reptiles, such as the tortoise and the snake, which gave rise to the birds; and on the other side the mammals, at first humble, like the kangaroo; then more important, like the elephant; and at last the highest order of animals, such as the ape. Then the earth was ready for man, its master.

THE MAKING OF THE BODY

IF we think of a number of different animals, such as an elephant, a bird, a bee, and a serpent, we see how very different the bodies of animals may be, and yet, perhaps, we shall find that even here there is order, and that the points in which the bodies of different animals agree are more important than those in which they differ.

If we could summon before us all the animals that exist, and look at them carefully, we should be able, in spite of all their differences, to divide them up into two great classes, so that all the animals in one class would be far more like each other than they would be like any animal in the other class. In the one class we should place all the animals that have a backbone, and in the other all that have not.

It is true that we should find a very few animals about which we could not be sure, or, rather, which we should have to place between the two classes, for there are a few kinds of animals still living on the earth which have only half a backbone, or something that looks like a sort of rough model of a backbone. These animals are, of course, immensely interesting, because they teach us how the backbone began, and we need not mind that we cannot put them into classes.

CONTINUED FROM PAGE 574



Well, now, let us begin first with what are much the least important class of animals—those which have no backbone. We shall deal with them first, because they actually came first. For very many ages there were animals of many kinds living in the sea, and others living on land—these last always cold-blooded—which had no backbones; and if you had searched the whole earth and all the seas you would not have found a backbone anywhere—any more than you would have found a brain. You might as well have gone looking for a brain or a backbone amongst the plants as in the animal world of those distant days.

These animals which have no backbones are very difficult to arrange in any kind of order. Some of them are more wonderfully made than others, and have not existed on the earth so long. But they differ from each other so widely that it is really quite impossible to arrange them in a simple order. In any case, however, these backboneless animals, such as insects, oysters, and worms, are very humble and unimportant.

As we have hinted, none of them has a brain. This does not mean that they cannot feel, nor that some of them, such as the bees, are not very

wonderful in many ways ; but, after all, until that great thing called the brain came into existence, no great progress could be made. So we need here say nothing more about the backboneless animals.

Nor need we here say anything about the curious kinds of animals which show us the first hints of a backbone. In some ways they are among the most interesting animals in the world, because small beginnings that lead to great things are always interesting. But here, whilst not forgetting that the earliest backbones were very rough and imperfect things, we may begin with those animals, very well known to everyone, in which first a complete backbone—though a very simple one—is to be found, and these are the fishes.

THE FIVE GREAT CLASSES OF ANIMALS WITH BACKBONES

If now, beginning with the fishes, we study all the different kinds of backboneed animals that exist, we find that though there are many thousands of them, yet they can all be arranged in a very simple way. More than this, it is possible, quite certainly, to show which class came first, which last, and so on. Many hard-working men are trying to arrange the animals that have no backbone in this way, but they have not succeeded yet.

Here, then, are the five great classes about which there is no doubt of the backboneed animals—fishes, amphibia, reptiles, birds, mammals. Now, some of these words are strange, but they are really not difficult, and we shall easily explain them. For instance, if you have not heard of amphibia before, at any rate you know a frog when you see it, and if you have never heard of mammals, it is easy to remember that mammals are animals which feed their young by means of milk, as, for instance, a cow, which feeds her calf. A human mother feeds her baby in the same way, and human beings are by far the highest kind of mammals.

THE HISTORY OF THE ANIMALS THAT HAVE BACKBONES

Now, there are very great differences between a fish, a cow, a sparrow, and a frog ; but yet they all agree entirely in the main lines on which their bodies are made, because they all have a backbone. And we shall see soon that they agree in

many other things besides. It is true that the fish is cold-blooded, and breathes water (or, rather, the air dissolved in water), whilst a cow or a sparrow is warm-blooded, and breathes air, but so far as the great history of the body is concerned, all these backboneed animals are far more like one another than they are like any animal that has no backbone.

Now we want to trace upwards, if we can, the history of these various kinds of backboneed animals. The first, we are certain, were the fishes, and though the fishes have given rise to so many creatures far more wonderful than themselves, yet, in the seas in which they first came into existence, they still thrive. There are many different kinds of fishes, as we all know, though all the fishes that we eat are very closely related to one another.

There are many other kinds of rare fishes which few of us have ever seen. But we may take all the fishes as a group, and remind ourselves of the chief facts about them. They are the first animals with backbones ; they live in the water and breathe the little air they find in water ; they are therefore cold-blooded, and on no account must they be confused with certain strange mammals like the whales, which live in the water but breathe the air above it, and, like all mammals, are warm-blooded.

THE ANIMALS THAT LIVE IN THE SEA ARE NOT ALL FISHES

Again, all fishes have a backbone, which is the principal part of what we call their skeleton ; and this skeleton is inside their body, and is covered with soft parts like muscle and skin. This fact, the possession of a skeleton inside the body, built upon and around the backbone, is true of all backboneed animals.

Just as on no account whatever must we confuse the fishes with animals like the whale, which is a newcomer on the earth compared with the fish, so we must here give up, once and for all, the utterly wrong notion that all the animals found in the sea are fishes. It is simple nonsense to think of a clam, or an oyster, or a star-fish, or any kind of so-called shell-fish, as true fishes. On the contrary, these animals have existed ages and ages longer in the sea than any fish. They have no backbones, a hint of a brain, and are as inferior to the fish as the fish is to a cow. We have no

more right to call them fish because they live in the water than we have to call a worm a bird because it breathes in the air.

Now, backboned animals very often have limbs—fore legs and hind legs, or arms and legs, or wings and legs—and the making of these limbs is one of the most important facts in the whole history of the body. Soon we shall trace this up from the fishes.

The nearest approach to anything like limbs that we can find in fishes is to be found in their fins. Certain fishes had a long fin stretched right along each side of the body, from head to tail. From the long side fins of very ancient fishes arose the paired fins of the fishes we know to-day. In simpler fishes there is one pair of fins just back of the head, and a second pair further back. Learned men believe that the two pairs of limbs of land animals arose from these paired fins of fishes.

THE FISH THAT GROWS INTO AN ANIMAL

Now, you remember what we said lately about the great step taken by life when first it "swam ashore." We know even now certain fishes which can get along for some time in the air, and they give us a little hint of what happened, especially since some of these fishes are very clever at hopping along in the mud. If now we turn to the next class of backboned animals, which have that difficult name amphibia, we shall be able to guess what happened.

The word amphibia is really a Greek word, and all it means is "both-life." It is just a word made up to say that animals of this kind, such as the frog, lead both kinds of lives—life in water and life on land. Now, they do not lead both kinds of life backwards and forwards, one way or the other as they please, but each amphibian begins by leading the one kind of life, and goes on by leading the other. So it gives us a hint as to the history of life in the great chain of backboned animals.

When the frog is very young, it is called a tadpole. This lives in water and breathes water. If it never went any further, we should properly call it a fish. While it is a tadpole it is like a fish; but, of course, if it were no more than a fish it would live in water all its days. The tadpole does not do this,

but after a time it begins to make great changes in itself; there begin to be hints of limbs and, what is even more important, of lungs; and at last the little tadpole grows up into a frog, which is not a fish, which has arms and legs, or fore limbs and hind limbs, and which breathes air by means of lungs.

THE GREAT-GRANDPARENTS OF THE FROGS LAID THE PLAN FOR ANIMALS

Not only so; but this frog has hands as we have, each having four fingers and a thumb, whilst it has five toes on each of its feet. Indeed, ages and ages ago, the first frogs, or the great-grandparents of the frogs we know now, laid down the plan of the kind of limbs which all backboned animals since then have had; though some of them, like the bird, do not keep this kind of five-fingered limb all their lives.

Now, when the frog is grown from the tadpole, into a backboned animal with four limbs, breathing air by means of lungs, it is really very like, indeed, to certain of the next class of backboned animals, which are called reptiles. It is not like a snake, but it is like a little lizard—and especially if that lizard has no tail. Indeed, the simplest way of looking at this is to think of the amphibia as fishes when they are young, and reptiles when they are grown up. The young frog or tadpole is practically a fish, because it is made as a fish is made, and does what a fish does. The grown-up frog is practically a reptile, because it is made as the reptiles are made, and does what they do.

WHEN THE REPTILES WERE THE MASTERS OF THE EARTH

Now we leave the amphibia and may pass on to the next class of backboned animals that appeared upon the earth, which were the reptiles, and of these we need not say much, except simply that a great many of the reptiles have gradually lost their limbs and have become very long and round and crawling, until at last they took the shape of snakes and serpents. Nevertheless, snakes and serpents in their very tiniest and earliest stages show that they are the children of creatures that had limbs, and we are quite certain of this. A snake has no limbs that you can see, not for the reason that a worm has no limbs—for a worm never had any—

but because it has lost them and has taken to moving about in a different way.

Now we are getting much higher, and coming to times nearer to our own. There was a stage in the story of life when the reptiles were masters. There was then nothing to beat them. They grew to great sizes, and if you go to museums you may see the remains of their bodies, sometimes sixty feet long. Some of them, especially the smaller ones, grew great stretches of skin between their outspread fingers, a sort of web such as we find in the feet of many swimming birds, and so they were able to fly more or less. Some of them were perhaps very fierce and powerful, and they had terrible teeth in almost endless numbers. It must have been a very strange earth in the age of reptiles.

HOW THE BIRDS FIRST CAME INTO THE WORLD

But then, somehow, a most wonderful thing happened. This was guessed at long ago, but it was proved only last century, especially by the discovery of the remains of certain curious animals which do not now live upon the earth at all. If you think of a snake, and then of a lark, it would certainly never occur to you that the birds have sprung from reptiles; but if, instead, we take a reptile, such as a small lizard, which has not lost its limbs, and if then we look at the remains of certain creatures which once existed, we discover that actually the wonderful birds have sprung from the reptiles. Of course, there are a great number of very marked differences between reptiles and birds, both in what they look like and in their ways of life. No bird now living has teeth, for instance; birds have feathers, and so on. But yet, when we discover the remains of birds which did have teeth, and so on, we learn that this is really true. The great class of birds has sprung from the reptiles.

Lovers of birds are almost inclined sometimes to place them on a level with the mammals themselves, and it is true that in some ways the birds are equal to the mammals, and in some ways even superior to them. But really no one, not even the best lover of birds, questions that the highest group of animals, the highest group of living

things of any kind, are the mammals. Where did they come from?

Now, it seems most likely that the mammals did not spring, like the birds, from the reptiles, and it is quite certain that birds did not spring from mammals or mammals from birds. Indeed, we must go right back, not so far as the fishes, but at any rate as far as the amphibia, in order to find where the mammals have sprung from.

THE GREAT UPWARD CLIMB OF THE ANIMAL WORLD

The picture on page 670 shows us how from the fishes there sprang the amphibia; how from some of the amphibia there sprang the reptiles and birds; and how from others of the amphibia there sprang the mammals. Of these, the earliest led a hard life on the earth, I believe, even during the age of reptiles.

They cannot have had anything like the strength of the reptiles, but yet they survived and flourished—partly by keeping out of the reptiles' way, and by going to corners where the reptiles did not want to live, but more especially because of the great care they gave to their children—a care far better and finer than anything to be found in the whole of the rest of the world of life. And so they went on from strength to strength, until now, man, the highest of the animals, is the master of the earth.

Now, throughout all these long ages, while so many changes have been happening, and so many different kinds of animals have come into being, nothing has ever happened to do away with the backbone.

THE CHIEF FACTOR IN THE MAKING OF OUR BODIES

On the contrary, it has steadily become more and more perfect. You know quite well what the backbone of a herring is like; it is a very useful thing, without which no herring or other fish now living could grow; but it is very simple, and only fit for a creature which leads a very simple life, and from its birth to its death it makes practically only one kind of movement.

As we pass upwards we find, in the frog, for instance, that the backbone is becoming at the same time stronger and less simple, and as we pass up higher still we find this process going on, until in a mammal the backbone

is so far from simple that you might spend a lifetime in studying it.

In ourselves, as in the fish, it is the chief factor in the making of our bodies. It is something like the keel of a ship, upon which everything else is built; but it is, at its simplest and smallest and weakest, a million times more wonderful than the keel of the biggest ship that ever was or ever will be made.

THE BUILDING UP OF THE BACKBONE OF THE BODY

You know quite well that the backbone is not really one bone, but is made up of a great number of little bones laid in a line. Indeed, these little bones are built or placed on one another, just as you may place a number of stones upon one another to form a column, when you are making a building. For this reason the backbone, or spine, as it is often called, is quite as often called the spinal column. The little bones of which it is made have the not really very difficult name of *vertebræ*, a single one being called a *vertebra*, and the scientific name for animals that have a backbone is *Vertebrates*, while those which have none are called *Invertebrates*.

Now, we must say just a word or two more about the limbs of backboned animals. These limbs have bones in them, and these bones are joined or jointed on to the backbone, just as the little bones which make the backbone are joined or jointed with each other. As we saw, these limbs really arose from the side fins of the fish.

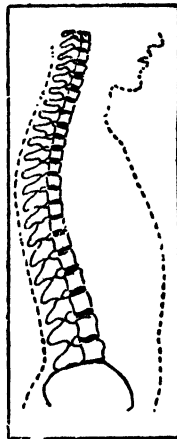
HOW THE ANIMALS MAKE USE OF THEIR WONDERFUL LIMBS

All backboned animals above the fishes either have two pairs of limbs all their lives; or have them at the very beginning and lose them afterwards, like the snakes; or have them when they are grown up, but not at first, like the frog. No backboned animal ever has more than two pairs of limbs.

The serpent loses its limbs, the whale turns its fore limbs into flappers, and in order to find its hind limbs, or legs, which have fallen out of use altogether,

you have to dig deep in its blubber, or fat, but you will find them all the same—toes and all. The birds have learnt to turn their fore limbs into wings. When the chick is very, very young indeed, it has five fingers on each hand, like its forefathers, but later on it finds that these are more than it needs to build a wing upon, and when it is grown up we find that the wing is really only built upon three and a half fingers. The other one and a half have disappeared, since they were not wanted.

The use of limbs is for movement; but if we trace limbs upwards from the days of the frog, or at any rate from the days of the earliest mammals, we find



The backbone is built up of many small bones. This shows the backbone and its place in the body.

that the fore limbs get to be used not only for movement, but also for other purposes. For instance, we know for what terrible purposes the tiger uses his claws. If we go to a higher mammal than the tiger—as, for instance, to the monkey—we find that he does much more with his fore limbs. The cleverest lion or tiger, though it will steady its food with its claws while gnawing at it, cannot pick up its food in the way that we can and take it to its mouth. The monkey does this; it has learnt the great art of grasping. In the monkey the fore limbs are at least as important for grasping as they are for moving about on.

In man the spinal column has been made into a real column because it stands upright, and only tiny babies now use their fore limbs for walking. Once the crawling stage is passed, our arms are freed for ever from purposes of walking, and are used instead as the great servants of the brain, so great that without them man could have done nothing in the world, and, indeed, would have been starved and hunted out of the world by animals long ago.

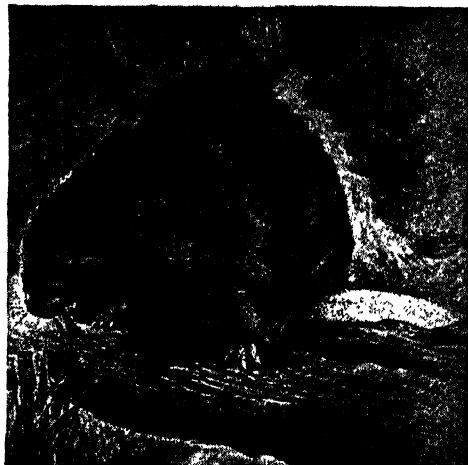
It is almost impossible to say how important is the freedom of man's arms, or fore limbs, from the mere purpose for which he now uses his feet, and for which the hands of all other backboned animals have been used for so many ages. But the hands of men, as we said, are the servants of the brain and the nerves.

THE NEXT PART OF THIS IS ON PAGE 317.

HOW THE BEAVERS BUILD THEIR HOMES



The coypu is one of the largest relatives of the beaver, which it somewhat resembles. It lives in the water, but instead of making a hut and a dam it makes a tunnel from the bank into the water.



The beaver is like a big water-rat, but has a flat tail covered with scales instead of hair. This is the rudder with which the beaver steers when swimming, and it acts as a support when he sits up to eat.



Here we see a beaver-dam on a stream in Canada. The dam can be seen in the distance, made of sticks and mud, and stretching from one bank to the other. Notice the three large trees. Their trunks have been partly gnawed through by the beavers, and they will soon fall and be cut up to enlarge the dam.

The Book of NATURE

WHAT THIS STORY TELLS US

THE great power of man over the animals comes from man's mind. Man can think and make up his mind; he can remember yesterday and prepare for to-morrow. Yet often when we read of animals we must wonder whether animals have not a mind. The wonderful things they sometimes do can only be done by creatures which think and plan and act with a purpose. Such clever little builders as we read of in these pages must have something like our brain—the beginnings of a mind, perhaps. Certainly they must be a great deal higher in creation than the fishes, and a great deal better workers, perhaps, than some men. We read here of the wonderful homes they build for themselves across streams, on the banks of lakes, and down underground, and the story of their building, although we know that it is true, reads like an animal fairy tale.

NATURE'S LITTLE WORKMEN

BEAVER
COYPU
PORCUPINE

CAPYBARA
AGOUTI
CHINCHILLA

JERBOA
JUMPING HARE
MARMOT

PRAIRIE DOG
VISCACHA
POCKET-GOPHER

MOLE & SHREW
WATER-SHREW
DESMAN

IF you looked at a list giving all the trades which men and women in this country follow, you would be surprized at some of the kinds of work mentioned in it. "I did not know that there were such trades," you would say. If you could have a list of the ways in which Nature's little workmen earn their living and provide their homes, you would be still more surprized.

We have fire and gas and electricity and tools and machinery to help us, but animals have nothing but that which Nature gives them. It is quite enough, too. There is a fish which can give you an electric shock as strongly as an electric battery. We have tailors; but there are tailors among the birds who make their own thread and sew with their bills. Man can use a gun, and throw a stick or a stone in the chase; there are fishes which shoot flies, squirting water, which drenches the fly, and makes it fall into the mouth of the shooter.

Another fish angles as artfully as men angle. It has on its head little growths which look like worms that the little fish love to eat. The angler-fish sinks to the bottom of the water into the mud or reeds, but lets these little worm-like growths stick up above his hiding-place, until the fish, attracted by what they think to be worms, swarm around. Then

CONTINUED FROM PAGE 632



the big fish pops up from the mud and catches them.

We preserve food of all sorts for future use; so do beasts and birds and insects. We build cities; so do numbers of animals and insects which burrow in the earth. We love to have our homes beautiful; so do birds, and some animals. Humming birds decorate their nests with pretty colored lichens, but the satin bower bird builds a handsome little assembly hall, like the arbors which we see in old gardens. Here he places pretty shells and white stones, bright feathers from other birds, and anything he can find that looks gay and pleasing. This is not his nest—that is built in another place—but a meeting-place where the birds may pass their time amid scenes which please them.

We shall learn much more of these wonders later. Here we have taken just a peep at some of them, so that we may not think that the little workmen about whom we are going to read are the only masters of arts and crafts in the animal world. The fishes and birds and insects we will leave till a later day; here we must look into the doings of animals with which we are familiar, and some which are strange.

The beaver is common enough by name, but it is not an animal commonly seen. It lives mostly in

North America and Canada, but it was once abundant in England and Scotland and Wales, as well as in most countries of Europe; but men have so cruelly hunted it that only a few are now to be found out of America. To tell the truth, it would be rather dangerous to have it plentiful in countries where people live near the rivers. It does its work so well in the rivers that it would cause men's homes to be flooded.

HOW THE BEAVERS SET OUT TO BUILD THEMSELVES A HOME

Looking like a great water-rat, the beaver is about two feet long, and has a tail which is unlike that of any other animal. This tail is ten inches in length. It is flat, and has scales instead of hair, and weighs about four pounds. It is the rudder with which the beaver steers when swimming, and it acts also as a support when the beaver sits up to work or to eat. To understand the work of the beaver, let us picture its life.

A couple of beavers set out to make a home for themselves. They must be near water, for they love to swim in it. Their hind feet are webbed like those of a duck, specially for swimming. Not only do they like the water, but part of their food grows under water. Here, then, are our beavers swimming down the stream, until it brings them to a wood in which are willows and other trees that they like. It is a good place for a home, so they decide to settle.

All would be well if the conditions did not change; the beavers might make a hole or two under water into the banks of the stream and live happy ever after. But they know that a stream is not always the same. In the summer, when there is little rain, there will be little water in the stream, not enough to swim in, and so low that their holes in the banks would be left exposed; then their enemies, the otter, the wolverene, and man, could easily find them.

HOW THE BEAVERS GET THE WOOD TO BUILD THE DAM

In some strange way the beavers know this as well as a man would, and they at once set to work to do as a trained engineer would. They start to build a dam or wall across the stream. This will prevent the water from flowing away when the weather is dry; and when the floods come, by an opening in the dam, the beavers can let off enough water

to prevent their homes from being swamped.

Where are they to get materials? It is growing all about on the banks. The trees are the building material. The beaver has wonderful teeth with which it can cut down trees. The outer edge of the teeth is formed of the hardest enamel; the inner side is of soft ivory. The result of this is that the inner side of the tooth wears down in biting, leaving the outer edge hard and sharp, like our finest steel chisels.

With his sharp teeth the beaver now goes to work upon a tree which is overhanging the river. He sits up on his hind legs, and rests his forepaws on the trunk of the tree; then he gnaws away in a ring all round the trunk. If you have seen an hour-glass you will know the sort of mark that the beaver makes in gnawing through a tree. He bites all round so smoothly that pieces of wood cut through by beavers at the Zoo appear to have been cut by hand.

When he sees that the tree is going to fall, the beaver either darts into the water, or runs to some other safe hiding-place. Down comes the tree, then the beaver sets to work to bite off the branches and to cut the trunk into logs.

HOW THE BEAVERS THROW AN ARCH ACROSS THE STREAM

With these logs he begins building across the stream. The logs are laid flat. Then the beaver dives to the bottom of the river, or goes to the bank, and brings mud and stones to plaster the logs and make them secure. It gathers up the mud with its forepaws, and, holding it under its chin, so carries it. They work very hard, and soon the result of their work begins to appear. The boughs of the tree are stripped of their bark—for that is good for food—and then they are woven into the dam. In this way the beavers work away until they have made a wall of logs and branches, fastened together with mud and stones, right across the stream.

If the stream flows gently, the dam is built in a straight line from bank to bank. If, however, the stream is a rapid one, it will cause greater pressure on the dam. The beaver, in this case, builds his dam with a curve, the middle of the curve facing up-stream. You know how strong an arch is; well, the beaver makes his dam into a sort of arch, lying

SIX LITTLE ANIMALS WITH POWERFUL TEETH



The agouti is a sort of big, long-legged guinea-pig from South America, which does good when it eats weeds, but great harm in sugar plantations.



The capybara is the biggest of the rodent family. Its fat body is so thick that it nearly touches the ground. It is clumsy on land, but swims beautifully.



The marmot, which is about the size of a rabbit, lives in rough burrows. When winter approaches a dozen or more will build a winter home and store up an abundant supply of food.



Prairie dogs, which are really marmots, live in burrows on the plains of North America. On the entrance to each a marmot sits as sentinel. When danger threatens he warns the others with a yelp.



Viscachas live in colonies in South America, and burrow regular villages. These animals decorate their homes with bones and bright stones.



The pocket-gopher gets its name from possessing two little pockets, one on each side of its face. In these it can store its food until it has time to eat it.

on its side. As the water flows it brings down driftwood, soil, and other matter with it. All this is built into the dam by the beavers, so that it becomes in time a very big barrier. An opening is left at the top for the water to escape. Some of it, however, will flow on to the land lying on both sides of the river. This is just what the beaver wants.

After a time he has cut down all the trees on the river-side, and he finds the task of rolling or pushing logs of trees cut down far from the stream a difficult one. When the water flows inland he makes little canals with it. He makes proper channels, or deepens those which the overflows have caused, and into these channels he rolls the logs which he has cut, and so is able to float them down to his dam. By this time the beavers have got a pond or lake in front of their burrow. The water is too deep to freeze to the bottom in winter, so the beavers will not have their homes frozen in. Now they can set to work to make a proper dwelling.

THE BEAVER'S LITTLE HUT AND THE TUNNEL LEADING INTO IT

They build a house which is like a small hut. The same sort of material is used for this as for the dam. Logs and branches and mud and stones are beautifully built together, with a thick plaster of mud over all. When the frost comes this mud freezes as hard as rock, and the beaver is secure from his enemies. But how is the beaver to get in and out? There is no way in from the land. That is part of the beaver's plan. He makes two tunnels down in the earth leading from his home into the water. One tunnel serves when the water is all right. The other tunnel comes out lower down in the water, so that, if in the winter the water is frozen round about the top tunnel, the other will still be free. He can come out by this winter passage and go to the store of barks and twigs which he has hidden under his dam.

Inside the little home is as neat and nice as possible; it is about a yard in height from the floor to the top of the roof, and six or eight feet wide, and the walls and roof are thick, so that the home is like a little fort. Grass and twigs form carpet and beds, and here father and mother and baby beavers are as snug and happy as their skill and hard work entitle them to be.

There are not very many beavers now, for they were so constantly hunted for a long time that they have nearly all disappeared near the homes of men. People used to make beaver fur into hats, and their skin into slippers and waistcoats.

A BEAVER'S HOUSE WHICH CAUSED GREAT FLOODS IN CANADA

Beavers can quite alter the character of a place where they make their home, therefore it would be impossible for them to live near the haunts of men. They are bound to dam the streams if they are left to themselves, and that means that the surrounding country may be flooded. Not many years ago some beavers built a dam in a river near a railway in Canada. Their work caused the river to flood the country round about, and wash away part of the embankment. This would have been dangerous if allowed to go on, so the railway men cut through the beavers' dam, and let the water run off. The beavers repaired the damage. Again the men cut it, and again the beavers repaired it. Fifteen times the beavers repaired the damage. Then they found that it was useless to build, and gave it up and went away.

The beaver has rich brown fur, though sometimes black ones are found, and sometimes even white ones. They work at night when their enemies are not about. They are the most famous of a large family of animals called rodents—that is, animals which gnaw.

THE COYPU, AND THE TUNNEL IT MAKES IN THE RIVER-BANK

One of the family which is something like the beaver is the coypu. This is about the same size as the beaver, and lives in water, but instead of making a hut and a dam it is satisfied with a tunnel from the bank into the water. It swims beautifully, and without any noise, just like the beaver, but it does not make a flapping noise on plunging in, by striking its tail flat on the water, as the beaver does. The coypu's fur is as much prized as that of the beaver. It is a very good mother, and when it wishes to take its babies out for a swim, carries them on its back until they can go into the water without its help.

After looking at a coypu, which resembles a beaver, you would hardly expect to find that it belongs to the same

family as the porcupine, but it does. The porcupine does not swim, it has not fur like the coypu, but long, sharp prickles or quills, yet it belongs to the same family as the coypu and the beaver. They are all rodents—that is, animals which gnaw, like the rat and the rabbit. Its gnawing makes the porcupine a relation of the beaver.

HOW THE PORCUPINE DEFENDS ITSELF FROM ITS ENEMIES

It has splendid teeth like the other rodents, but it never uses them as a means of protecting itself. It seems to say to its enemies, "I can hurt you if you attempt to hurt me, but I do not wish to attack you."

The Old World porcupine, which is found in parts of Europe as well as in Africa and India, is a moderate-sized animal, and grunts like a pig. Its spines vary in length. The longest are not the strongest. Those which do most damage to an enemy are from five to ten inches in length. When it is attacked, the first thought of the porcupine is to protect its nose, which is very tender. Then it causes its quills to stand upright, which makes it look a terrible beast. If it cannot get away it curls itself up in a ball. A hungry tiger or leopard will occasionally try to kill it, but it is a bad day's work for the animal which does attack. The quills press into the enemy's flesh, and as they are easily loosened from the skin of the porcupine, they stick where they have entered the flesh, and cause bad wounds.

THE PORCUPINE WITH A TUFTED TAIL AND THE PORCUPINE WHICH CLIMBS A TREE

Savage animals, when dead, are sometimes found to have the quills of porcupines fastened in them. This led to the belief that the porcupine could shoot out its quills, but that is not the fact. They become detached from the animals in the way that we have described. At other times, if the spines are loose and old, they drop out when raised to meet an enemy. The porcupine never attacks another animal. It comes out of its hole in the ground after dark, and eats roots and plants and the bark of trees. It can do without water, if the juice in its food is sufficient for it.

Strange as the ordinary porcupine looks, the tufted-tailed porcupine is stranger still to see. The quills of this

one, instead of being round, are flat like swords. The tail is scaly for the most part, but at the tip there is a bunch of soft quills which, though of no use as weapons, may serve to frighten other animals. This one lives in India and in Malacca, and has been found elsewhere.

Canada has a porcupine which climbs the trees. Its food consists of the bark and leaves of trees. Beginning at the top of a tree, it works its way from branch to branch right down to the root, eating all the leaves, and stripping off every bit of bark. This kills the tree. The porcupine is well known in the Northern United States also, and the quills which the Indians use in ornamenting baskets are from this species.

The big porcupines have only small tails, but there is a porcupine in Brazil which has a long tail, like an American monkey, and uses it in the same way, winding it round the branches of trees to help it in climbing. In the days when there were no foresters to cut down trees, the work of the tree porcupines would be of benefit, as if trees grow too thickly in the forests they die. The thinning out of their number would be for the good of the rest. But when tree after tree is taken it is very serious.

SOME LITTLE ANIMALS THAT DO GOOD AND BAD BY TURNS

There is another animal which does good and bad by turns. This is the capybara. It is like a great big swimming guinea-pig. It is the biggest of all the rodent family, its fat, heavy body being three feet in length, and so thick through that when the capybara walks it nearly touches the ground. It is clumsy on land, but in the water its webbed feet carry it along beautifully. It is a wonderful diver, and can remain under water for some minutes at a time. As it eats only vegetable matter, it does good work in the rivers of South America by keeping the banks from being overcrowded with vegetation and the bed of the stream from getting choked up.

That is good work, but when the capybara forsakes the river, and runs wild in the sugar-canes which men have planted, then it does great damage, and that is a reason why men hunt it. The other reason is that its flesh is good to eat. The capybara can be tamed, and makes a pleasant companion in the lonely wastes of South America.

Another animal in the same part of America which does good and bad by turns is the agouti, which does good when it eats the overcrowded vegetation of the forest and swamp, but becomes an enemy to man when it gets among his sugar plantations. The agouti is a sort of big, long-legged guinea-pig, but it has a tiny tail, which the guinea-pig has not. It is very nimble, but it cannot keep up its pace for a long run.

The long, thin legs of the agouti bring to mind some more famous rodents—the chinchilla and the jerboa. The chinchilla has lovely fur, which is much liked by ladies. It has this warm fur because it lives high up among the mountains of South America, where the weather is cold. It is a dear little animal, and very clean in its habits. After it has done a little burrowing for its home, it will come out into the open and carefully wash its fur, so that not a speck of dust shall remain upon it. The chinchilla is classed with the same family as the jerboa. Both chinchillas and jerboas are great jumpers. They jump not with all four feet, but with the two hinder ones, like the kangaroo, and their tails help to balance them.

HOW MEN CATCH THE JUMPING HARES IN AFRICA

The jerboas do not live in America, but in Asia, and East Europe, and Africa. They make homes in the dry ground, and are wonderful to watch when making their flying leaps through the air, but they do much damage where grain is grown.

The biggest of them all is the Cape jerboa, called also the Cape jumping hare. It burrows in the sides of mountains or on warm, sandy plains, and, unless checked by man, multiplies exceedingly. So much harm does it cause to crops that men have to hunt it for their own protection. Nothing can catch it as it bounds about, many feet at a time, among the rocks, so men practise a trick. As soon as the jumping hares see men, they all dash into their holes. Then men pour water down the burrows. This so frightens the animals that they rush out, and are caught. The jerboas take men's crops not merely for present use, but for their winter food.

In this respect they are like the Asiatic marmot, which provides for the winter. But the marmot takes only grass, which is converted into hay,

and so kept for the long, cold days when green food is not to be had. During the summer months the marmot, which is about the size of an average wild rabbit, and rather like one, lives on the mountain-sides, where a rough burrow is good enough for its home. But when winter is coming on a dozen or more set to work to build a winter palace. First of all they make a long underground passage, which opens out into great central chambers. Here the food for winter is placed and a safe haven of rest made.

THE SWARMS OF PRAIRIE DOGS ON THE PLAINS OF NORTH AMERICA

When the snow falls upon the mountains, the marmots scurry into their nice warm home. They close up the passage which leads out into the cold, filling it up with earth and hay. Then they are safe and snug and warm, and can go to sleep for the winter, waking up every now and then to eat a meal of the nice hay which they have stored.

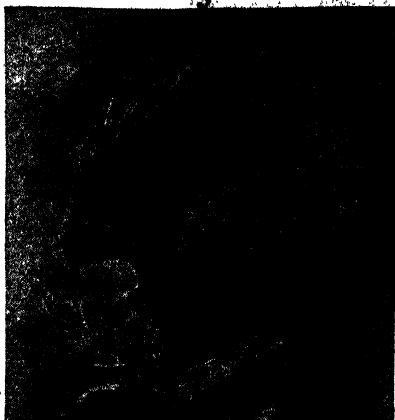
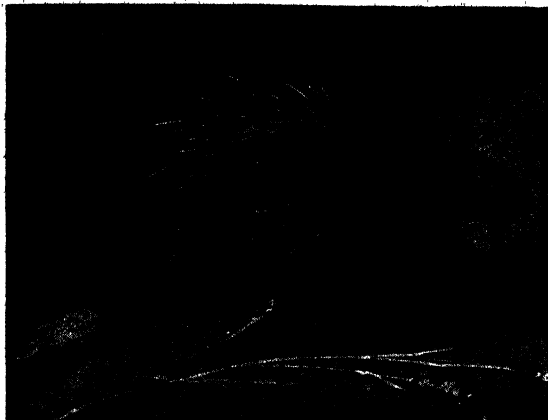
The prairie dog is really a marmot. It is called a dog because, when alarmed, it makes a little yelping sound like a tiny dog. Swarms of prairie dogs live in burrows upon the rich plains of North America. They have scores of burrows, all bored deep into the ground, each burrow being crowned at its opening by a big mound of earth. They are busy little animals, and rush about from burrow to burrow all day. But on the top of each mound a marmot sits as sentinel. If danger approaches, he gives a sharp yelp, and in an instant all the marmots rush down their burrows, and not one remains to be seen. Soon, however, a scout will come out, and if all is well he gives a sort of whistle, whereupon the others all troop out to resume their work.

A WONDERFUL ANIMAL CITY BUILT UNDER THE GROUND

Sometimes a rattlesnake will make a visit upon the prairie-dogs. The marmots cannot say "no," for they do not fight other animals, so there the visitor stays. But he is a bad guest, for he eats the young marmots.

A similar thing happens in the home of another rodent, the Argentine viscacha. Into this underground home goes the Argentine fox, to eat a young viscacha whenever it desires. The wonder is that the viscachas are not

THE PORCUPINE AND THE GREAT JUMPERS



The tufted-tailed porcupine differs from its cousins in having a tail with a bunch of soft quills at its end. These are harmless, but they serve to frighten its enemies. The quills of this Brazilian porcupine are flat like swords.

When a porcupine is attacked its first care is for its nose, which is very tender. It erects its spines, which make it look a terrible beast. Sometimes it curls up like a hedgehog.



The Canadian porcupine is a tree-climber, and its food consists of the bark and leaves. Its tail is short, but strong.

The Cape jumping hare is a kind of large jerboa, which burrows in the side of the mountains or on sandy plains and multiplies rapidly. It can leap several feet at a time.



The pretty little jerboa is a wonderful jumper, and has long, thin hind legs like a kangaroo. Its tail helps to balance it, as we see here. Jerboas live in burrows in deserts.

The chinchilla, like the jerboa, has lovely fur, and makes a delightful pet. It is as careful as a cat in keeping its fur clean.

clever enough to get rid of such an intruder. They are clever enough in other ways. The viscacha makes its home on the Pampas, where it burrows a regular city, which, when finished, often covers a space of 200 square feet. As the soil is brought up from below, it is carefully deposited so as to form a great mound round about the entrance to the burrow.

THE VISCACHAS LIVE TOGETHER IN LITTLE VILLAGES IN THE EARTH

In order that this may be done, the viscacha first makes a trench straight out from the burrow, along which it carries the soil. Presently it makes a trench from the end of this first one, but branching off to the left; then it makes another branching off to the right, so that the paths approaching these underground dwellings are shaped like a capital Y.

Many passages are made underground for the work. These lead to large chambers, from which other passages run off, and there may be more big chambers at the ends of these. All round the entrance to the burrow the herbage is kept cropped close, so that the animals can see if an enemy approaches. They live together, several villages adjoining, in perfect friendship. Should any accident happen, by which one village gets closed up, the viscachas from the next village are said to rush up and dig out the prisoners. The inhabitants of one village will visit another village, but they never go into each other's burrows.

They lived in this way on the plains long before men had their farms there. It was the constant cropping of the grass by these little animals which made the herbage so rich and good and fine, and because of that men were able to pasture their sheep upon the land.

THE UNDERGROUND HOUSE-BUILDER WITH TWO POCKETS FOR FOOD

But the poor viscachas cannot remain near men's homes. They have made the grass fine and good, but they eat so much that they ruin a sheep-farm, therefore they have to be driven away or killed. It is another case where animals were doing Nature's work until man came with his tame animals, requiring all the food that the land can furnish.

One other curiosity about the viscachas we must note. They like to decorate

their homes as the bower bird does. They collect everything they can find—bones, pieces of rock and stone and all sorts of things. If a man loses any of his property near where these animals live, he presently goes straight to their burrows. They will have found it and carried it away as part of their decorations.

Another of the house-builders underground is the pocket-gopher, which is such a pest to farmers in the western United States. Its odd name means that it has two convenient little pockets, one on each side of the face. In each of these the gopher can store food. Thus, if it finds something good to eat while it is busy tunneling, it need not stay to eat it then and there, nor need it waste it; the food is popped into the pouch and kept there until the gopher is ready to sit down to dinner. He lives almost entirely underground, so that his eyes and ears are very small. His claws are very big and strong.

HOW THE GOPHER CARRIES HOME A LOAD OF FOOD

He makes his home very skilfully, working head first into the burrow, and finishing all smooth and straight as he goes. As he is burrowing into the solid ground, of course the soil which he scrapes away must go somewhere. He pushes it under his body and back behind him as he works. Presently he turns round to clear up. He fastens his front paws together under his chin like a shield, then with his hind legs he presses forward, and the loose earth is pushed out of the hole.

There is another strange thing about the gopher—he can run backwards just as easily as he can run forwards. When he is carrying food to his storehouse he need not turn round to carry it back; he simply trots backwards, then comes out head first again, gets some more food, and trots backwards with it again once more. Of course, he can carry quite a load in this way when both his pockets are full. If the pieces are too large, or have sharp corners which would hurt, he gives them a nip or two with his sharp teeth, then pops the pieces into his pocket. When he wishes to take out the food, he presses his front paws against the sides of his face, and it topples out before him.

THE MOLE AND ITS WONDERFUL HOUSE

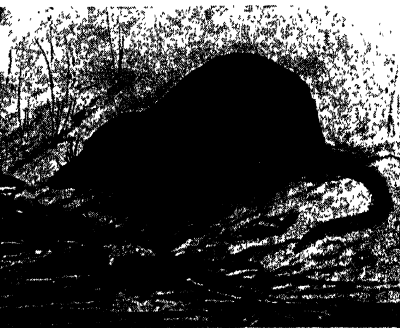
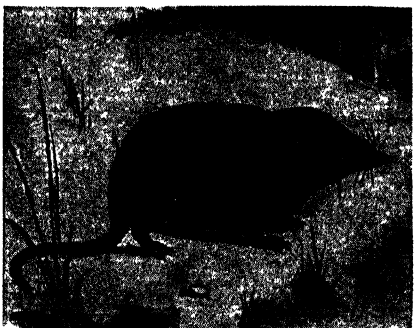


The mole is the little master-builder of our fields and gardens, and is a wonderful workman. He eats worms which would do injury to the farmers.

The desman is a kind of shrew with webbed feet, with a tiny trunk like a very small elephant's trunk. It feeds on small fish, worms, and insects.



The mole's underground home is a very wonderful structure. It consists of a central hall, arched over with a vaulted roof, and with many entrances. The mole also constructs a special nursery for its children. The tunnels and hall are made strong and smooth, and they do not fall in, even though great rain-storms should soak the earth. The mole makes long burrows underground in search of worms.



The shrew is a pretty little animal, not quite three inches long, with a pointed nose, and a tail about an inch long. It makes a snug underground nest.

The water-shrew is very much like its land cousin in appearance, but it lives largely in the water. It makes its home on the river-banks.

The photographs in these pages are by Chas. Reid, Lewis Medland W. P. Dando, and D. English.

All this talk about the burrowing of animals abroad must have made you think of that little master-builder in our own fields and gardens—the mole. He is as wonderful a workman as any of them. Indeed, no burrowing animals make a more beautiful home than this little friend of the farmer. All that we see from the top are little mounds of earth, which we call mole-hills. They are simply shafts which the mole has tunneled from below to throw up the soil which his great claws have dug.

THE GREAT WONDER THAT LIES BENEATH A MOLE-HILL

Nothing but a picture can give you an idea how wonderful are the works of the mole. He has tunnels running in all directions, all made on the strongest and most beautiful plan. Some are short cuts by which he and his family can dart away in time of danger. Others are long highways leading, on careful plans, all about his underground estate. He has a splendid central hall, arched over under a vaulted roof, and with five or six entrances. He has a proper nursery for his children. If you have tried to make a building of sand or soil, you know how hard it is to keep the place from tumbling down. The mole has only soft soil in which to work, but in it he makes his great tunnels and his lofty hall smooth and hard; and they do not fall in, even though great rain-storms should soak the ground.

That is the mole's work. His pleasure is in eating and in getting food for his family. He eats worms and grubs, which would do great injury to the farmer. Of course, he can miss his way, and throw up hills which will spoil the finest lawns or pastures. That is bad, but he makes this good by his work in the borders and in the fields.

HOW THE MOLE MAKES A TUNNEL AND SINKS A WELL

To show how he can tunnel, this story will help you. A gentleman has a big conservatory, in which he grows peaches and strawberries and grapes. He could not imagine how it was that the soil used to get so cut up and tossed about in the conservatory. But his gardener found that moles were at work. They had runs out in the grounds, and, finding that worms and grubs were to be had in the soil of the greenhouse, they burrowed under the

foundations of the building and into the conservatory. This could not be allowed, for it did damage, so traps were set. In a fortnight the gardener caught a dozen moles in that conservatory.

Have you heard people say "as blind as a mole"? They do not know anything about the mole when they say this. The mole, like the bat, which is also believed to be blind, can see. It has tiny eyes set deep in its fur, so that they shall not be injured by the soil.

You would not die of thirst if you could set a mole to work as engineer. Its keen sense of smell enables it to find water at once. It sets to work with its splendid claws, and sinks a well to where the water is.

If you find a long, little burrow just under the surface of the ground, you must not think that you are looking at one of the walks of our little friend the mole. That may be the tunnel of the shrew, which makes a nice little round passage with a snug nest at the end of it, but not on such a big scale as the mole's. The shrew is a pretty little animal, not quite three inches long, with a long, pointed nose, and a tail about an inch and a half in length, which does not taper away as a mouse's does.

THE LITTLE SHREWS THAT FIGHT UNTIL ONE KILLS THE OTHER

It is supposed to be terribly savage, but it is not unless one male shrew meets another male shrew. These two fight until one is killed. Otherwise the shrew is a cheery, good-tempered little fellow, and not so fierce as the mole. It has many enemies, and so is bound to make some efforts to save itself, or the whole family would soon be killed. Owls will eat it, but, though cats will kill it, they will not often eat it.

This shrew lives only on land, but there are shrews which live in the water as much as the beaver does. We have several sorts of water-shrews in America, but none is so remarkable a shrew as the desman. This is a shrew with webbed feet, and with a tiny trunk for nose, like that of the smallest of small elephants' trunks. The nose serves the desman in many ways.

The food of the desman consists of small fish, insects, and vegetable food, most of which it can get in the water where it passes its day.

THE NEXT STORY OF ANIMALS IS ON PAGE 801.

The Book of WONDER



WHERE DOES THE DAY BEGIN?

NOW, said the Wise Man, the world is full of mysteries and of wonders, and there is no need for us to puzzle ourselves by making any that do not really exist. We could quite easily make all sorts of puzzles about time and the way in which it is reckoned; but we must understand that these puzzles are not *real*, but are made entirely by ourselves—not by Nature.

The real fact is quite simple. The sun goes on shining *all the time*, you know—it is well to remember that "the sun is always shining somewhere"—and the earth is spinning all the time. So the sun is always seeming to rise somewhere, because at some place or other the earth is just spinning round, so as to face it, and the sun is always seeming to set somewhere, because at some place or other the earth is just spinning away from the sun. That is simple.

And, of course, whatever we call *now*, whether we call it six o'clock or twelve o'clock, *this now is now everywhere*. The present moment is the present moment here and on the farthest star. Only when just opposite the sun we call that mid-day, whereas the people on the other side of the world are then away from the sun, and call it mid-night; but this present moment of ours is their present, too, of course,

CONTINUED FROM P. 613.



and the difference is merely a difference of name to indicate that *now* we are opposite the sun, and they are away from it. It would be foolish for us to make a mystery where none *really* exists, or to forget that *now* must be *now* everywhere.

But, simply because the earth goes on spinning, and the sun is always shining, the day is dawning somewhere always, and *really*, therefore, the answer to the question, "Where does the day begin?" is that the day is always beginning somewhere.

ARE THERE TWO DAYS AT ONCE?

Since people live in different parts of the world, what we call night (when it is our night) will be someone else's day, and our mid-night, when a new day begins for us, as we reckon, will not be the mid-night of other people in other parts of the world, so that what we call Monday they may call Tuesday, yet we and they are both talking about the same moment!

Now, it would be very inconvenient if people in all the different parts of the world spoke of time as if they were the only people on the earth, and as if their midnight must be everybody's midnight—which it is not. So we reckon by two sorts of time. One is *local* time—the time reckoned by what is

happening at the particular place whose time it is; the other is *standard* time, which we agree upon, so that we can catch trains, and so on, just as if midnight in one place were midnight everywhere. Up till 1883 people often missed trains through this difficulty, and then "standard time" was invented.

WHERE DOES THE HOUR CHANGE?

Now let us see what this means. You understand that, as the earth spins toward the east, the only places at which the dawn comes at the same minute are those on a line drawn from the North to the South Pole. When one of our readers in Boston is up and eating his breakfast, it is still dark in Denver, since the earth has not turned far enough for the rays of the sun to reach that city. When the schools in New York are dismissing for luncheon at noon, the pupils in San Francisco are just going into school.

In order to prevent confusion, lines have been drawn across the American Continent from North to South, dividing the country into five "time belts" or zones. A small part of Eastern Canada has Atlantic Time. Then come Eastern, Central, Mountain and Pacific. In each zone the clock is an hour slower than in the one before. When it is ten o'clock in Halifax, it is nine o'clock in Boston, eight in Chicago, seven in Denver, and six in Vancouver.

If one kept on traveling westward, the sun would rise later and later every day, and when he had gotten all the way around the world, he would have lost a whole day. If he traveled eastward the condition would be reversed.

WHERE DID THE ALPHABET COME FROM?

No one really knows all about where the alphabet came from, because it grew very slowly, like children and like every other good thing in the world. But we know quite well that no clever man sat down and made the alphabet, and we know quite well, too, that the alphabet began as pictures.

Just as a child reads or takes things in by pictures long before it can read letters, so men used to read and write by pictures; and then these pictures were gradually made simpler and simpler, until at last they could be used in every and any way, as our letters can. We

know for certain that the letter O was at first the picture of an eye, and that gradually men made the picture simpler and simpler, until at last they just drew an O. We know for certain also that the letter I was once the picture of a man standing, and many people think that the letter A was once the picture of a house; and very likely a capital A may have been at first the picture of a pyramid.

Ages and ages ago in Egypt men used both kinds of writing. The priests used the oldest kind, which were the pictures. This was called the sacred writing. But the ordinary people used a different and newer kind of writing, in which the pictures were turned into letters. Not very many years ago, men tried in vain to read the old sacred picture-writing of the Egyptians, but they could not. Then they found the wonderful stone Rosetta, and that this had written upon it the same thing three times—once in the pictures and once in the letters, and also once in other letters, and so men got the key to the picture-writing, and now it can be read easily.

WHY DO WE HAVE NAMES?

Well, plainly, said the Wise Man, we have names for the same reason that everything has a name. If we did not have names, we should have to have numbers, like the numbers on motorcars, which serve just the same purpose. Now, there are names which have meanings, and there are names which have none, and it is always well to know how much and how little a name means. There is something which we call electricity, which means really that it has something to do with amber, for when you rub amber you get electricity, but people sometimes speak as if the name explained electricity, or as if it explained something else to say that it was electricity. That is because they do not know how little the name means. We might just as well call electricity X—which is the name in what is called algebra for something we do not know.

One thing you ought to know, however, is the meaning of your own name. If your name is Theodore, for instance, you ought to know that that means the gift of God. Many of our names have meanings, which you can sometimes find in the Bible. The Bible tells you,

for instance, what Peter means, but you must find out for yourself where it is.

WHY DOES THE FOUNTAIN PLAY?

The puzzle about the fountain is that the water comes upwards, though we know that water always tries to fall; it falls because the earth pulls it. Now, something must be pushing the water up more than the earth is pulling it down, and the question is what? The answer is that water is acted upon by the force of gravity, and it runs downhill in a pipe just the same as in a brook;

only in the pipe the water is pressed upon by the water higher up and is forced out at the lower end of the pipe. Now if this end is turned upwards we shall have a fountain. In the siphon of soda-water we also have a fountain. If the spout turned upwards instead of downwards it would act just the same as any other fountain. In the soda-water bottle there is gas under greater pressure than the pressure of the air; so when it gets a chance the compressed gas within forces the soda-water up the tube in the middle of the bottle and out at the spout.

WHAT IS IT THAT MAKES THE FOUNTAIN PLAY?



A fountain plays because the water comes to it from a great height. In the fountain shown in this picture, the water falls from the reservoir through the water-course, so that the water runs until it finds the air again, when the pressure is released

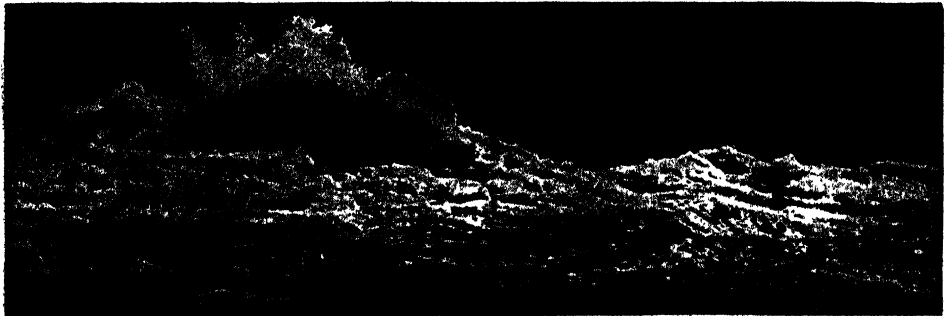
A RIVER FALLING OVER A CLIFF



One of the greatest falls of water in the world is that at Niagara. The River Niagara, shown in this picture, flows rapidly along between Canada and the United States until it comes to Goat Island, which divides it into two parts. Then the river rushes over two huge cliffs. Here we see the river before the fall.

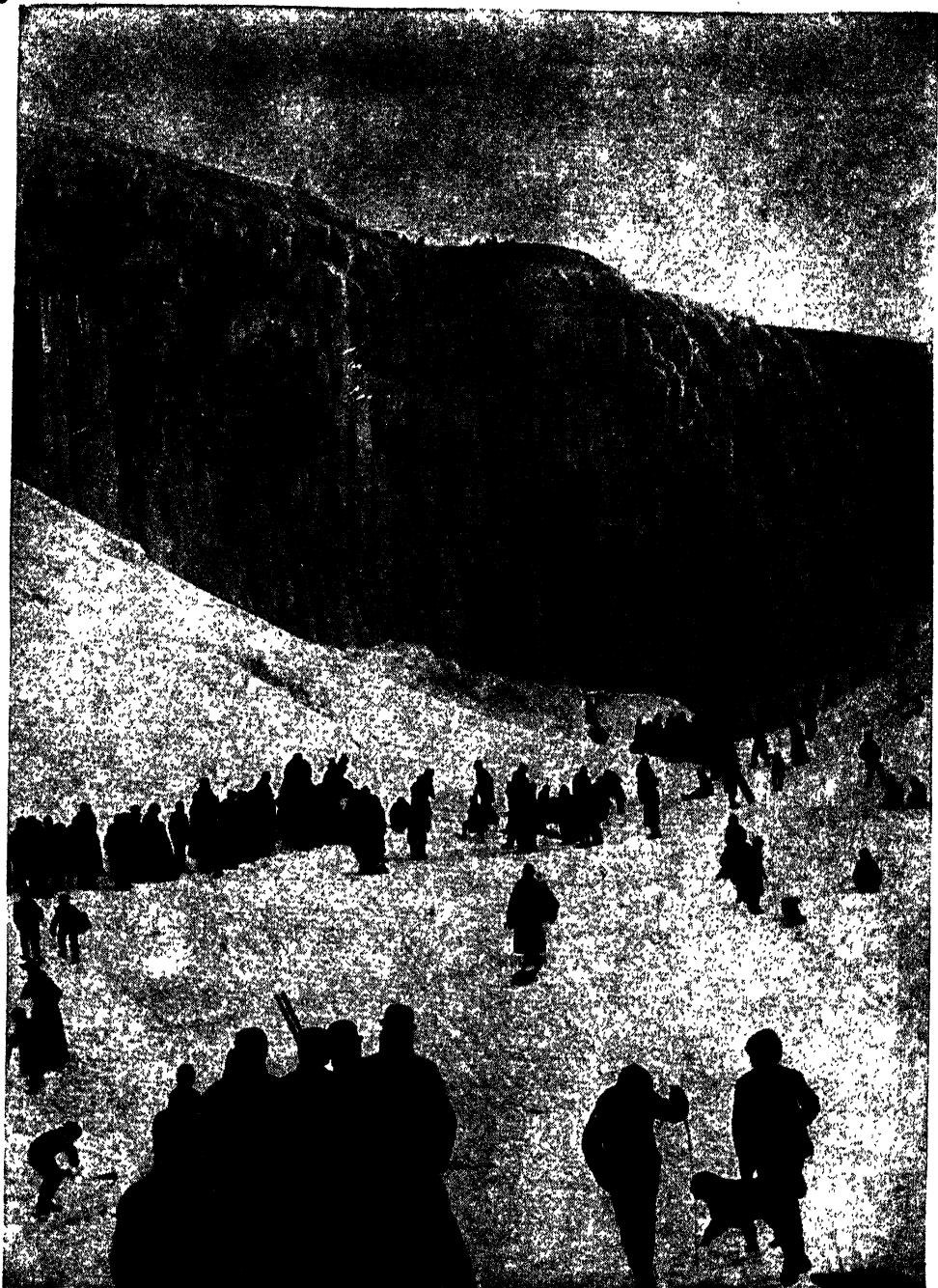


Here we see Niagara river taking a plunge of 158 feet. No one who has not seen this marvelous waterfall can imagine what it is like. The water roars like thunder as it plunges down the cliff, clouds of spray are thrown into the air, and when the sun shines a beautiful rainbow is seen across the sparkling water.



This picture shows Niagara below the falls. There are two of these great falls side by side, called the American and the Horseshoe Falls. As soon as the water has plunged over them it rushes through a narrow gorge, turning sharply to one side, and the two streams form the Whirlpool Rapids.

THE BOOK OF WONDER
JACK FROST STOPS THE FALL OF NIAGARA



This is one of the most wonderful things ever done by Jack Frost. It is a picture of Niagara in winter. No man's hand, no machine ever made by man's hand, could stop the mighty rush of Niagara over the cliffs; but winter does it, and silently ends the roar of the waters. When winter comes the cold is often so severe that parts of the Niagara Falls are frozen over, and then the sight is one of the most beautiful in the world. Part of the frozen falls is shown in this photograph. Imagine enormous icicles, far thicker and taller than the pillars in any cathedral, all sparkling like diamonds in the sunshine. The frozen spray covers the rocks and trees near the falls with wonderful hoar-frost, looking like beautiful moss and ferns of glittering white.

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HOW DOES A COAT KEEP US WARM?

Now, this is a very good, sensible question, said the Wise Man, for you have used exactly the right words in asking it; and this is just a case where, because a question is properly asked, it can be easily answered. If you had said, "How does a coat *make* us warm?" I should have had to tell you that a coat does not *make* us warm, but that all any coat can do is to *keep* us warm. Except when the sun is actually shining upon us, or when we are huddling over a fire, we make all our warmth for ourselves. There is no warmth in a coat or in any article of clothing. So, of course, clothing cannot make us warm—unless, indeed, we hold it in front of the fire until it is hot, and then put it on. Indeed, when you come to think of it, we make our clothes warm. Our clothes often feel quite cold when we put them on, but when we take them off they are warm, and they have got the warmth from our bodies.

HOW DO CLOTHES KEEP IN OUR WARMTH?

Our clothes keep in the warmth which we make for ourselves simply because they are made of stuff which will not let warmth out. All sorts of things can keep all sorts of other things from running about. When you put water in a tumbler, the water cannot run through the glass; it is kept in. When you pull a shade down over the window, the light is kept out; when you put suitable clothing on anything, its heat cannot get through it, and so it keeps warm. The reason why we put a tea-cosy on a teapot is exactly the same as the reason why we put clothes on ourselves. The clothes or the tea-cosy prevent the warmth from getting out, just as the shade prevents the light from getting in, and just as the glass of the tumbler prevents the water from getting out. This works both ways; and sometimes people put clothes on to keep heat from getting into them, as when you put on a straw hat on a sunny day.

Clothing is only something that warmth cannot get through. Now, warmth is always trying to run from warm places to cold places—from our bodies to the outside air; or from the outside air

into something else. And, in either case, if you want to keep things as they are, if you want to keep warm things warm and cold things cold, you must put a barrier between heat and cold, so that the warmth cannot get through.

HOW DO CLOTHES KEEP ICE COLD?

That is a good question; the best way to understand how clothes keep us warm is to learn how to keep ice cold. Well, now, if clothing is simply something that keeps back heat, as a blind keeps back light, what would happen if we put some clothing on the ice? If we choose nice warm clothing—which simply means that it keeps us warm—ought it not to keep the heat from outside from getting into the ice?

Now, that is exactly what happens. If we take the warmest kind of clothing that we can think of, which is flannel, and if we wrap the ice up in flannel, we keep the ice cool, and prevent it from melting. Now, do you not think that is rather funny? When we want to keep ourselves warm we put on warm clothing, as we call it; and when we want to keep ice cold we put warm clothing on it. Would you not almost have thought that the clothing which made us warm would make the ice warm too, and so make it melt? Well, so it would if the clothing were really warm, like a hot bottle. But then, you see, it is not really warm; there is no warmth in it at all.

WHY ARE SOME CLOTHES WARMER THAN OTHERS?

You know what a thermometer is. It is something that measures how hot things are. Now, if you take a piece of flannel and a piece of linen that have both been in the same room for some time, and if with a thermometer you try to find out how hot they are, you find that they are both just at the same level of hotness. But on a cold day you would rather put on flannel than linen, because, as we say, the flannel is so much warmer. Yet, according to the thermometer, the flannel and the linen are each just as warm as the other.

What is the meaning of this puzzle? It is simply that some things are better barriers to heat, and keep heat back better, than other things. Some things will let it through quickly, some slowly.

WHY ARE SOME THINGS COLDER THAN OTHERS?

In an ordinary room without a fire all the different things are just as warm as each other, because, if it has time enough, the warmth will spread itself equally over everything about it, running from anything that started hotter to anything that started cooler.

Yet if you go and touch several of the things in the room, one after the other, you find that they feel very different as you touch them. A thing like the fender will feel cold; the carpet will feel warm; wood would feel colder than the carpet, but warmer than the fender. Now, that is simply because these things differ in their power of keeping heat from running through them, just as flannel and linen differ. The brass of the fender lets heat run through it very quickly, but the carpet lets heat run through it very slowly, and so we say that the fender feels cold and the carpet feels warm, just as a linen sheet feels chilly when we get into bed, whilst a woolen blanket feels warm. If a thing carries heat quickly away from our finger, it makes our finger cold, and we say that the thing is cold; and we call another thing warm in comparison with it, if that other thing, like flannel, only carries away the heat from our finger very slowly.

HOW DOES A MACKINTOSH KEEP US DRY?

A mackintosh keeps us dry because it is made of a material which water cannot get through. Our ordinary clothes are full of tiny little holes, or pores, and so we call them porous. The water runs into these little holes, and so will make our clothes wet, just exactly as it runs into a sponge, which is also full of holes, or pores—only these are so big that we can see them. But if you take a thing like a piece of india-rubber, you find that water cannot get through it because there are no holes in it to let the water through; or you can take a piece of ordinary cloth, which is porous, like a sponge, and then, if you melt india-rubber and put the cloth in it, the rubber will fill up the holes in the cloth, making it waterproof.

The name of the man who found out how to do this was Mr. Mac Intosh, and that is why many kinds of waterproof coats are called mackintoshes now. For

no particular reason we have put a "k" into the word. Now, there is another kind of material which also keeps water out, or, at least, in its natural state it keeps water *out*, but we take it and cut it up, and put it into bottles and use it to keep water and medicine *in*. There is a special kind of tree which makes this *cork*, but really all trees have a layer of cork inside the bark, and this makes them waterproof. India-rubber is also got from trees.

And so, when we wear a mackintosh, we first of all take something from the coat of a sheep to make woolen cloth, and then we take something from the world of plants in order to make the cloth waterproof. If we wore the sheepskin with the wool in it, that would be waterproof, for the skin of a sheep is waterproof, just as our own skin is waterproof, though you may never have thought of that before. What in the world would happen to us when we took a bath if our skins were not waterproof?

WHY DOES A WHEEL GO ROUND?

A wheel goes round for the same reason as the earth or a top. Nothing goes round or moves of itself, but it always requires some force from somewhere to move it. If it is a bicycle wheel that goes round, it is the force of the muscles of your leg that makes it do so, or if it is a carriage wheel, the force is produced in the muscles of the horse; but if once anything is started spinning—as the earth, or a top, or a wheel—it will go on spinning until something stops it. In the case of your bicycle, when you stop pedaling, the wheels gradually move more slowly if you are going on the level, because the resistance of the air slows you down, exactly as the resistance of the water slows a boat down when you stop rowing. But you know that if you are going downhill you will not stop, but may actually get faster and faster. This is because, though the air is resisting your bicycle, the attractive power of the earth, which we call gravitation, is pulling on the bicycle, and it pulls more strongly than the air holds you back.

WHY DOES A WHEEL STOP?

Well, I have already given you one of the reasons why a wheel stops when

it has once been started, and that is the resistance of the air. But wheels also stop through another kind of resistance, which is called *friction*. The wheel of a bicycle, for instance, travels round and round on something in the centre of it, which we call the axle, and as the wheel rubs against the axle it is made to go slower. If you put your finger on your arm and rub it along your skin and press a little, you can see how you are opposed by friction; but if you put some oil on the tip of your finger first, the finger will slide along your arm quite easily, because the oil lessens the friction.

For exactly the same reason you have to oil the bearings of a bicycle. Perhaps you know that a special way has been found in which to lessen the friction of a bicycle, so that, after you stop pedaling, the wheels will go on running much farther than they otherwise would. A number of tiny steel balls are put between the axle and the wheel, so that the wheel really runs on these little balls. This is what is called "ball bearings," and every bicycle has them, both for the wheels and for the pedals.

COULD A TOP SPIN FOR EVER?

Friction also helps to stop a top, but if you spin the top on a perfectly smooth plate, so that there is very little friction, it will spin much longer; and if you could spin the top on a smooth plate inside something from which you had taken away all the air, it would not be difficult to get the top to spin for hours, because *things which have once started moving go on moving until something stops them*. If the top could be spun where there is no air at all, and nothing happened to hinder the spinning, the top would certainly go on for ever. The earth is like a great wheel or top spinning round and round in space, but, as space is almost empty, and as the earth's air is part of the earth and goes round with it, and as the earth is not spinning on anything, as a top spins on a plate, the earth scarcely slows down at all throughout the ages.

HOW FAST CAN A WHEEL GO ROUND?

Now, you might think that if you applied sufficient force to a wheel—say, the wheel of some kind of engine that was driving something—it would go round faster and faster and faster, and

there need be no limit at all to the speed at which it went round. But that is not true, and sometimes when men forget it, and make wheels go round too fast, terrible accidents happen. If you take an umbrella that has been out in the rain, and twirl it round very gently and slowly, the drops of rain will hold on to the umbrella tight enough to go round with it, but directly you spin the umbrella a little faster, the drops of rain, as you know, fly off from the umbrella. As long as the umbrella went round slowly, the force of sticking, or *cohesion*, as it is called, was sufficient to make the drops stick to the umbrella, but when the umbrella went round a little faster, the force of cohesion could not keep the drops sticking to the umbrella, and so off they flow. But now, after all, it is nothing but cohesion that makes the parts of a wheel stick to each other, and if the wheel went round quickly enough, this cohesion would not be strong enough to hold the wheel together, any more than it is strong enough to hold the drops to the umbrella if spun quickly.

COULD A WHEEL FLY OFF AN ENGINE?

Sometimes when an engine has been set running too quickly, a great wheel, perhaps made of heavy steel, has flown to pieces. These pieces have gone flying out just as the drops do from a spun umbrella, and sometimes these have done terrible damage. This applies to everything that spins—the earth, or a wheel, or a top. There is a limit to the speed at which it can spin without flying to pieces, because there is a limit to the power of cohesion, or holding together, and directly that limit is passed, the pieces of the wheel, or the top, or the earth—if the earth were set spinning too quickly—must fly away. For everything that is moving tries to move in a straight line, and the reason why a wheel can spin at all is that the parts of it move in circles instead of in straight lines, because they are held by cohesion; but if cohesion is not strong enough, all parts of the wheel, like the drops on the umbrella, will start moving in straight lines instead of in circles, and the wheel will fly to pieces.

WHY DOES A STICK FLOAT?

We must remember that the earth is all the time trying to pull everything to itself; it pulls us, it pulls the air, it pulls

a balloon, it pulls the moon. Now, the heavier the thing is the more it is pulled, and water is heavier than a stick. This does not mean that all the water in a pond is heavier than a stick, because, of course, we know that. But it means that, if you had a cup and filled it with water, and had another cup the same size and filled it with stick, the cup with the water would be heavier—that is to say, in a fixed amount of space you can pack a greater weight of water than of wood. That is what we mean when we say that the water is heavier than the stick.

Of course, a pound of water is the same as a pound of stick, and you do not need me to answer the question—Which is the heavier, a pound of feathers or a pound of lead? They both weigh the same, only the lead takes up less room, and so we say that lead is heavier than feathers, though a pound of lead weighs the same as a pound of feathers. The

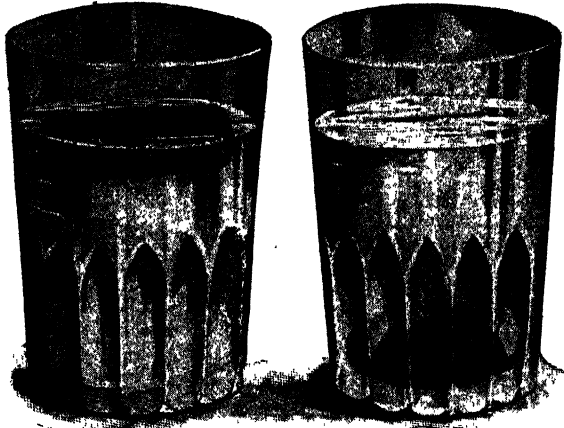
proper name for a heavy thing is *dense*, and, whenever it is possible, the earth always pulls the denser things furthest down, and the less dense things float on the top of it. That is why the stick floats; that is why the cold air is found nearest the floor, because cold air is heavier, or denser, than warm air, and

the warm air floats on the top of it as the stick floats on water.

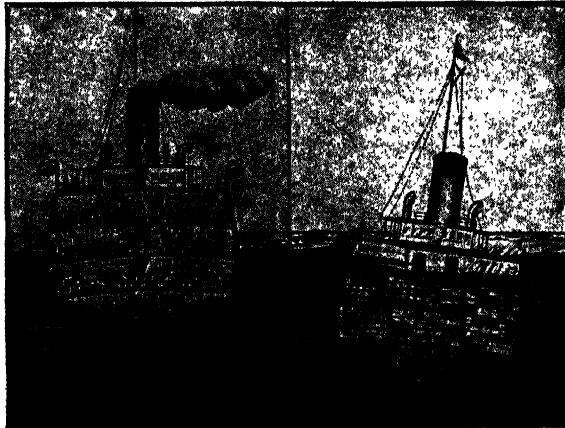
WHY DOES A STONE SINK?

The last answer really explains this question. The stone sinks because it is heavier, or denser, than an amount of water occupying the same amount of

WHY WOOD FLOATS AND WHY IRON SINKS



Wood floats because it is full of tiny quantities of air, and so is lighter, or less dense, than the water. A stone, or a lump of iron, has no air in it; it is denser than the water, and therefore sinks.



WHY AN IRON SHIP FLOATS

An iron ship floats because it is hollow and full of air, so that as a whole it is lighter than the water. If we filled it up with iron or stone, or if it cracked and so let the air escape and the water come in, it would sink, as shown in the second of these pictures.

packed it full of iron, or anything heavier than water, it would sink. There is a law that a line, called Plimsoll's line, must be painted outside the hulls of ships, and that ships must not be packed so heavily as to sink that line below the surface of the water.

room; and the water floats on top of the stone just as the stick floats on top of the water. It all depends upon the great law of the pull, or attraction, of the earth for everything outside it, and the heavier the thing is, the stronger the pull. A lump of iron sinks in the same way.

WHY DOES AN IRON SHIP FLOAT?

Men used to think that a ship had to be made of wood in order to float, but now all big ships are built of iron. The space they occupy is filled with air, which makes the ship, as a whole, lighter than water, and so it floats. You can put things into it, but the more you put in, the deeper your ship rides in the water. If you

THE NEXT QUESTIONS BEGIN ON PAGE 809

THE DISGUISED PRINCESS RESCUING THE LADY AMORET



Princess Britomart, disguised as a knight, is here rescuing the Lady Amoret, after slaying the monster, in fulfilment of a vow given by her to her absent lover. The story is told in the following pages.

The Story of FAMOUS BOOKS

STORIES FROM THE "FAERIE QUEENE"

AN allegory is a story in which the characters represent good or bad qualities. The "Faerie Queene" is a great poetic allegory by Edmund Spenser, first printed in the year 1590. It takes us to Fairyland at the time of the annual festival, lasting twelve days, and on each of these days a brave knight has to go forth on some adventure to fight against evils. Gloriana, the Fairy Queen, stands for Glory; Prince Arthur for the Spirit of Chivalry, St. George for Christianity, Sir Guyon for Temperance, Britomart for True Love, Sir Calidore for Courtesy, and so forth. The deeds of these and many other champions in overcoming the forces of evil are all told in the "Faerie Queene," which is the old way of spelling "Fairy Queen." Only six books of the great poem exist; the other six, in which the twelve days of adventure were completed, were lost by the poet's servant.

UNA AND THE RED CROSS KNIGHT & HOW THE KNIGHT SET FREE THE KING & QUEEN

ON the first day of the festival of the Fairy Queen there presented himself a tall, clownish young man, who, falling before Gloriana, desired a boon—as the custom then was—which, while the feast lasted, she might not refuse. This boon was that to him might befall an adventure during the festival. His prayer being granted, he seated himself upon the floor, being thought unfitted by his rank for a better place.

Soon afterward there entered a fair lady, named Una, who was in mourning. She was riding on a white ass, with a dwarf behind her, leading a war-like steed that bore the arms of a knight. Falling before the Queen, this lady complained that her father and mother, an ancient King and Queen, had been shut up in a brazen castle by a huge dragon. Would the Queen, she prayed, send one of her knights to liberate her parents from the dragon?

Hearing her request, the tall, clownish young man begged that he might be entrusted with the adventure. All wondered at his temerity, and none more than the Fairy Queen and Una. But, the youth urging his suit, the lady said that unless the armor which she had brought could be worn by him, he could not succeed. Thereupon, the armor being put upon him, "he seemed the goodliest man in all that company." He was



now given the rank of a knight, and, mounting the strange horse which the lady had brought with her, he set forth with her as the Red Cross Knight, accompanied by the dwarf.

For a time the beauty of the country through which they passed drew their thoughts away from the perils that beset their enterprise. But ere long a great storm arose.

Enforced to seek some shelter nigh at hand, A shady grove not far away they spied, That promised aid the tempest to withstand; Whose lofty trees, all clad in summer's pride, Did spread so broad, that heaven's light did

hide,
Not piercable with power of any star;
And all within were paths and alleys wide,
With footing worn, and leading inward far,
Fair harbour to them seemed, so soon they entered are.

And forth they pass, with pleasure forward led,
Joying to hear the birds' sweet harmony,
Which, therein shrouded from the tempest dread,
Seemed in their song to scorn the cruel sky.

Led on by delight, they did not notice, until the storm had passed and they wished to retrace their footsteps, that they had lost their way in Wandering Wood. Here was the den of Error, a fearsome monster, half woman, half snake, that dwelt in a darksome cave in the thickest part of the wood.

In no way daunted by the warnings of Una and her dwarf, the Red Cross Knight sought out this monster,

which, after a terrible encounter, he killed. Then, proceeding on their journey, the travelers found their way out of the wood. On their way they met a venerable-looking old man, dressed like a hermit, who greeted them with fair words, bidding the Knight take rest with the westering sun. "So with that godly father to his home they went."

A little lowly Hermitage it was,
Down in a dale, hard by the forest's side,
Far from resort of people that did pass
In travel to and fro.

THE WICKED MAGICIAN MISLEADS THE RED CROSS KNIGHT

They passed the evening with fair discourse. Drooping night creeping on, their host showed them their sleeping-place. While they slept the seeming hermit, who was none other than the wicked magician Archimago, caused the Knight to dream that his lady, Una, was false. Believing his dream to be true, the Knight fared forth in anger from the Hermitage, leaving Una behind.

When Una arose she looked in vain for her Knight. She began to wail and weep; but

After him she rode, with so much speed
As her slow beast could make; but all in vain,
For him so far had borne his light-foot steed,
Pricked with wrath and fiery fierce disdain,
That him to follow was but fruitless pain;
Yet she her weary limbs would never rest,
But every hill and dale, each wood and plain,
Did search, sore grieved in her gentle breast,
He so angelntly left her, whom she loved best.

One day, high weary of the irksome way, Una alighted from her slow beast. Resting in a secret shade, she was suddenly seen by a fierce lion. Eager for his prey, the king of the forest was rushing upon Una, when he was stopped by the sight of her great beauty, and, instead of attacking her, kissed her wearied feet, licked her lily hands with fawning tongue, and became her devoted attendant and protector. After undergoing many hardships and dangers, Una at last met Prince Arthur and was safe.

PRINCE ARTHUR KILLS THE GIANT AND THE TRAVELERS MEET A NEW PERIL

When he left the enchanted Hermitage the Red Cross Knight again encountered deception in the form of Duessa, a daughter of Archimago. Duessa, who was disguised, led the Knight to the House of Pride and per-

sued him to drink of the water of an enchanted spring, with the result that he fell an easy prey to the giant Orgoglio, who cast him into a noisome dungeon. From this he was rescued by Prince Arthur, who killed the giant, exposed the falsity of Duessa, the giant's accomplice, and reunited the Knight and Una.

Starting forth once more, these two came to the Cave of Despair, where a new kind of peril was met, to which the Knight all but yielded. Seeing all around the ruin wrought by Despair, the Knight threatened him with death, but so artfully did the villain speak in praise of death that, after trying to argue with him, the Knight yielded to his view, and taking from his hand a dagger, was about to plunge it into his own breast, when Una snatched it from him and, casting it upon the ground, said:

"Fie, fie, faint-hearted Knight!
What meanest thou by this reproachful strife?
Is this the battle which thou vauntest to fight
With that fire-mouthed Dragon, horrible and
bright?"

"Come, come away, frail, feeble, fleshly
wight,
Nor let vain words bewitch thy manly heart,
Nor evil thoughts dismay thy constant spright
(spirit).
In heavenly mercies hast thou not a part?
Why shouldst thou then despair that chosen
art?"

UNA TAKES THE KNIGHT TO THE HOUSE OF HOLINESS

Taking heart at these words, the Knight rose up, and was taken by Una to the House of Holiness, where Faith, Hope, and Charity dwelt. Here he was taught repentance; here he saw a vision of the Holy City prepared for the chosen of God; and here he gained strength for his task.

Once more in Una's company the Knight set forth for the brazen tower wherein her parents were besieged by the dragon. Encountering this fearful beast, the Knight fought with him for two days, and, coming again to the fight, gained the victory on the third day.

Thus were the aged King and Queen liberated; and so it came to pass that with great rejoicing Una and the Red Cross Knight—who was none other than St. George—were united in happy wedlock.

SIR GUYON, CHAMPION OF TEMPERANCE AND HOW HE OVERCAME THE ENCHANTRESS

THE wicked magician Archimago, having learnt that the Red Cross Knight had returned, as he was in duty bound, to the Court of the Fairy Queen, invented another scheme by which the hero might be brought to ruin. Accordingly, when he met Sir Guyon, the enchanter told a painful tale of how a beautiful lady, meaning Una, had been cruelly wronged by the Knight of the Red Cross.

Sir Guyon, the Champion of Temperance, thereupon set out to punish the recreant knight, but when they met and Sir Guyon was about to run upon him with his spear, he recognized his fellow-adventurer; so the two champions exchanged courtesies and parted.

Now, it was Sir Guyon's task to seek out and destroy the bower of Acrasia, whose wiles had brought much ruin to noble men, and when he was pursuing his journey, he heard from a neighboring thicket the voice of a woman crying. Alighting from his steed, he found Amavia dying by the side of her husband, Sir Mordant, and with her little child on her knees. Sir Mordant was one of the victims of the cruel Acrasia.

SIR GUYON VISITS THE CASTLE OF THE LADY MEDINA

After they had buried Sir Mordant and Amavia, Sir Guyon and the Palmer, a wandering pilgrim who accompanied him, found that Sir Guyon's steed and spear had been stolen by a boastful coward named Braggadochio. Taking the infant with them, the two travelers made their way to the castle of the Lady Medina or Golden Mean, who lived with her sisters Elissa (Too Little) and Perissa (Too Much).

The lovers of Elissa and Perissa were at enmity, and though both, when they saw Sir Guyon, went forth to attack him, before they could reach him they quarreled together. Medina came out and succeeded in making peace, and all went into the Castle, where they sat down to a hospitable board, while Sir Guyon told of the adventure on which he was bound. Leaving the child to the care of Medina, Sir Guyon proceeded on his way on foot. In the meantime, Braggadochio, flourishing the stolen spear and mounted on Sir Guyon's

steed, had by his show of false courage pressed a poor idler into his service. Thus armed and attended, he was met by Archimago, who, deceived as to Braggadochio's character, accused Sir Guyon and the Red Cross Knight of wronging him.

THE COWARDICE OF THE BOASTFUL BRAGGADOCHIO

Braggadochio boasted of the punishment he would wreak upon the heads of these knights. When advised that he had better be armed with a sword against such enemies, he declared that, since he had killed seven knights with such a weapon, he had sworn never to bear a sword again, unless it should be the sword of the very bravest of men.

Promising to secure for him the sword of Prince Arthur on the morrow, Archimago vanished so suddenly that the coward Braggadochio and his equally alarmed attendant fled in haste, and without turning their eyes, into a thick forest. Here the sound of a horn caused Braggadochio to fall from his horse, and, like the coward that he was, he crept into a thicket. His attendant, Trompart, however, looking round, was amazed to see before him a beautiful huntress, Belphebe, carrying in her hand a spear. While Belphebe was asking of Trompart the course pursued by a hart she had wounded, she heard a noise in the thicket, and was advancing when Braggadochio crawled from his hiding-place. He told her a lying story, but, undecieved, she threatened him and disappeared, whereupon he once more mounted his horse, and with Trompart went on his way.

THE ENCOUNTER WITH A MADMAN AND HIS UGLY MOTHER

While this incident was happening Sir Guyon and the Palmer encountered the madman Furor, with his ugly mother, Occasion, whom the Knight overcame and bound, effecting at the same time the rescue of the youth Phedon, who, having been deceived by a false friend, had killed him, and then fallen into the hands of Furor.

The Palmer was telling Phedon of the folly of passion when there rushed out upon them Atin, brandishing two darts. Atin sought to make Sir Guyon fly by

telling him of his master, Pyrochles, who was on his way thither, and against whom none could stand. Atin, who had been sent to find Occasion, taunted Sir Guyon with fighting against an old woman, and hurled against the Knight one of his fearful darts. But as this glanced off his shield, Sir Guyon was unhurt.

SIR GUYON IS LULLED TO SLEEP ON THE ENCHANTED ISLE

Pyrochles then appeared, and rushed at Sir Guyon, who, at length having him at his mercy, gave him his life, upon the condition that he rendered faithful service to his conqueror. Pyrochles then asked the Knight to let him release Occasion and Furor. This prayer having been granted, Occasion turned upon both Sir Guyon and Pyrochles, and, while the tumult was proceeding, Atin hurried away to the bower of Acrasia to tell Pyrochles' brother Cymochles that his master was slain, and to urge him forth to vengeance.

Cymochles, spurring on his mission against Sir Guyon, came to the shores of Idle Lake, whereon he saw a little boat, in which sat a lady fresh and fair, by whose sweet voice he was enticed aboard, entertained with song and story, and taken to an enchanted isle.

Here he was lulled to sleep. Then the lady, whose name was Phaedria, and who was a servant of Acrasia, betook herself into her boat again, and rowed to the other side of Idle Lake. Here she was seen by Sir Guyon, who asked her to ferry him over the water. Phaedria readily responded, but when Sir Guyon stepped on board, she quickly shot the

vessel away from land, so that the Palmer was left behind.

Arrived at the Island of Joy, Sir Guyon was attacked by the awakened Cymochles. Effecting a peace between the two, but unable to win Sir Guyon by her allurements, Phaedria took the Knight back to the other shore.

Resuming his journey, Sir Guyon came to the home of Mammon, the Money God, to whose temptations he might have succumbed but for the help of an angel. After three days of weary wandering in the underground realm of Mammon, Sir Guyon was found by the Palmer, lying in a swoon. Sir Guyon was still lying helpless, when Pyrochles and Cymochles appeared and disarmed him. But at this juncture Prince Arthur came on the scene, and, after a terrible encounter with the two Pagans, gained the victory and delivered Sir Guyon from his foes.

ACRASIA IS BOUND AND SENT CAPTIVE TO THE FAIRY QUEEN

Having recovered strength in the House of Temperance, Sir Guyon resumed his quest. Setting sail on the sea, steered by the Palmer, he safely passed the Gulf of Greediness, the Rock of Vile Reproach, the Wandering Islands, the Quicksand of Unthriftihead, and the Whirlpool of Decay, till he won the Bower of Bliss, Acrasia's home.

Here a new victim of the Queen of Base Pleasure was released by him, and other victims who had been transformed by her into wild beasts having been restored to their natural forms, Acrasia was bound fast, and sent captive to the Fairy Queen.

THE FACE IN MERLIN'S MIRROR

THE LADY KNIGHT & HOW SHE FOUND HER TRUE LOVE

BITOMART, the golden-haired daughter of King Ryence of Wales, looking one day into a glassy globe that Merlin, the wizard, had made, saw therein the image of Sir Artegall, a brave Cornish knight, and fell in love with him. Finding it impossible to make Britomart forget her vision, her old nurse took her to Merlin's cave, both assuming a disguise for the purpose.

The magician then told them that it was Britomart's destiny to wed the noble Artegall, and to become the mother of a line of kings. Donning the

armor of Angela, the Saxon Queen, and arming herself with a mighty spear, which she found in her father's chief church, Britomart set forth with her nurse in search of Sir Artegall. They encountered Prince Arthur and Sir Guyon, who had met with many adventures since their overthrow of Acrasia and her champions. Seeing one whom he took to be a strange knight approaching, Sir Guyon rode forward against Britomart. He was, however, quickly overthrown by the enchanted spear. Worse might have befallen him, but that

wise counsels prevailed at the instance of the Palmer, who accompanied Sir Guyon, and the party rode on in good fellowship.

They had not traveled far before they saw the fair Florimell, rushing by on a milk-white palfrey, pursued by a grisly forester. Prince Arthur rode after Florimell, and Arthur's squire, Timias, went after the forester.

Britomart, finding that her companions did not return, pursued her way with her own aged attendant. Leaving the wood in which they were, they came upon a goodly castle, before which they saw a single knight withstanding the onslaught of six others, servants of Malecasta, the Lady of Delight, whose castle it was—Castle Joyous by name. The single knight was he of the Red Cross—St. George. He declared himself true to Una, whereas the others were championing Malecasta, whose object it was to make all strange knights enter her service or prove in combat that the lady they served was fairer than the Lady of Delight. Taking the side of the Red Cross Knight, Britomart overthrew four of his assailants, and the other two submitting, all entered Castle Joyous.

BRITOMART AND THE RED CROSS KNIGHT FIGHT THEIR WAY FROM THE CASTLE

Here, after passing through a chamber in which every pillar was of gold, embossed with pearls and precious stones, Britomart was escorted to an inner room of even greater magnificence, where sat the Lady of Delight, who, believing her to be a man, fell in love with her. Because of her love, the Lady wished to keep the travelers, but, after a gallant fight, the Knight and Britomart overthrew her servants and left the castle.

Then as they journeyed together, the Knight recounted to Britomart the valiant deeds that Artegall had done, and she in turn told him all her story. So they passed the hours until the time came that each must take a separate road, and then they said farewell. Britomart's way brought her to the sea, where she met Marinell, who, in fear of a prophecy that he should be overcome by "a virgin strong and brave," had fled from love. Him she overthrew, and he was carried, half-dead, by his mother, the sea-nymph Cymant, to her home beneath the waves.

While Marinell was being tended by

his mother, Florimell, who had been seeking him, was flying from Prince Arthur and Sir Guyon with as much fear as she had fled from the grisly forester. Prince Arthur, learning Florimell's story from her squire, bethought him of his faithful Timias, who, on his part, had overtaken the forester at a ford, and, after a fierce fight, had slain him and his two brothers.

FLORIMELL CAST INTO A DUNGEON AT THE BOTTOM OF THE SEA

Sorely wounded, he was found by Belphebe, who, with her attendants, carried him to a fair pavilion in the forest, where she daily dressed his wounds and into his mind instilled devotion to beauty and purity.

Meanwhile, Florimell had taken shelter in a humble cottage. Here lived a witch, whose wicked son so affrighted Florimell that she fled before the dawn. Pursued by a monster called up by the witch, Florimell came to the sea, and, seeing a boat in which an old fisherman was sleeping, leaped into it, and with the oar pushed out to sea.

As the monster was wreaking vengeance upon Florimell's defenceless palfrey, it chanced that a knight, Sir Satyrane, came that way, and overthrew the monster, who, however, afterwards escaped to tell his tale to the witch. Then the witch made of snow a false Florimell, the real Florimell having been taken to the bottom of the sea by Proteus, and, as she refused to wed him, cast into a dungeon.

SIR ARTEGALL SEES THE FACE BEHIND THE HELMET

All this time Amoret, the twin-sister of Belphebe and the beloved of Sir Scudamore, had been kept in prison by the enchanter Busirane. After a series of adventures Britomart succeeded in liberating Amoret, with whom she fared forth to find Sir Scudamore, Amoret believing that her deliverer was a man. But Scudamore, deceived by lying tales, believed his Amoret to be false, and pursued his quest of her with a sorrowing heart.

On his way he met Sir Artegall, and, these two encountering Britomart, Sir Scudamore was unhorsed by the wonderful power of her enchanted spear. Sir Artegall going to Sir Scudamore's aid, the two fought long and valorously,

when, Britomart's helmet being struck aside, Sir Artegall was so overcome by her beauty that his arm fell powerless at his side, and he surrendered.

When Sir Artegall's helmet was removed and Princess Britomart saw his face, she recognized it as the one she had seen in Merlin's mirror.

Thus it was that the two were betrothed, but before the marriage could

take place Sir Artegall had to depart on another adventure. Sir Scudamore bewailed his lost Amoret, who had been lost in a desert. Here she was captured by a monster.

Saved first of all by Belphebe, Amoret was finally rescued by Prince Arthur, and Marinell was wedded to Florimell, the ceremony taking place in Cymant's home under the sea.

THE QUEST OF THE BLATANT BEAST AND HOW SIR CALIDORE LED HIM THROUGH FAIRYLAND

SIR CALIDORE'S quest was the destruction of the Blatant Beast, Slander, which had attacked Sir Artegall. On his travels he fell in with a troop of shepherds, with whom he stayed for a time. Among their number was Pastorella. Pastorella was beloved of all the shepherds, but especially by Coridon.

Sir Calidore fell in love with the fair shepherdess, and sought by the exercise of knightly courtesy to win her regard. But she, unused as she was to the ways of courts, remained unmoved. Then the knight, doffing his armor, clad himself in shepherd's garb, and tended the sheep with her. Joining in the rural sports, he was challenged by the jealous Coridon to a wrestling bout. Coridon being defeated, Pastorella placed the oaken crown of victory upon Sir Calidore's head, but he, "who in courtesy did excel," gave it to Coridon.

By such acts as these, Sir Calidore won his way among the shepherds and eventually to Pastorella's favor. One day, as he ranged over the fields, forgetful of his mission against the Blatant Beast, he came upon "a place whose pleasance did appear to pass all others on the earth that were."

It was an hill, placed in an open plain,
That round about was bordered with a wood
Of matchless height, that seem'd th' earth to
disdain ;

In which all trees of honour stately stood,
And did all winter as in summer bud,
Spreading pavilions for the birds to bower,
Which in their lower branches sang aloud ;
And in their tops the soaring hawk did tower,
Sitting like king of birds in majesty and
power.

And at the foot thereof a gentle flood
His silver waves did softly tumble down,
Unmarred with raggy moss or filthy mud ;

Nor might wild beasts, nor might the ruder
clown,
Thereto approach ; nor filth might therein
drown ;
But Nymphs and Fairies by the banks did sit
In the wood's shade which did the waters
crown,
Keeping all noisome things away from it,
And to the water's fall tuning their accents fit.

In this beautiful spot Sir Calidore saw the Graces dance to the piping of poor Colin Clout. Going towards them, he was amazed to see them disappear. On another day, when Sir Calidore was with the hapless Coridon and Pastorella, a tiger rose from the wood. Coridon ran to the rescue of his love, but when he saw the beast fully, he was so alarmed that he fled. Sir Calidore slew the tiger with his shepherd's staff. Thus it was that the knight finally won the affection of Pastorella.

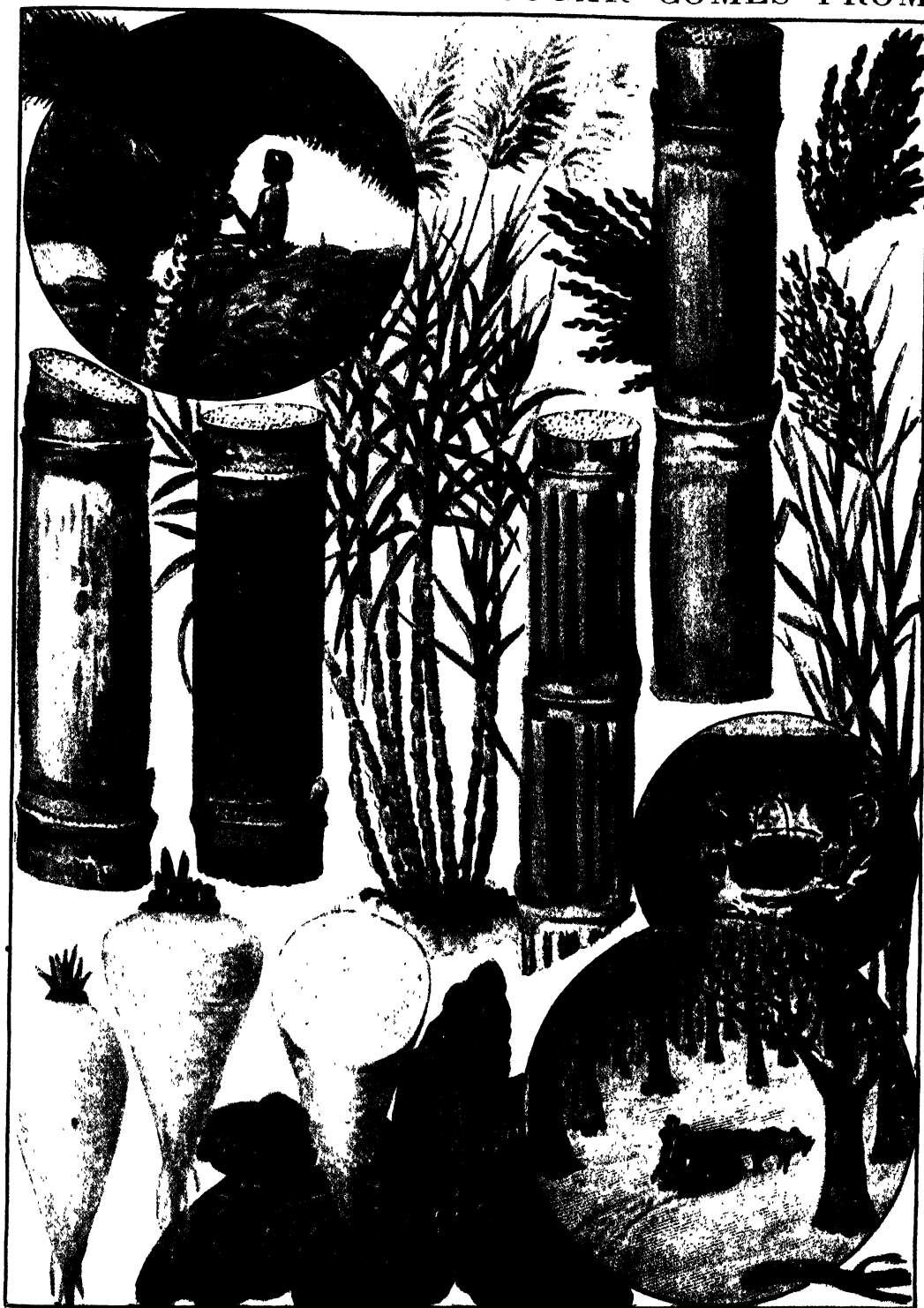
But his joy was turned to pain shortly afterwards, for the maiden was stolen by brigands. Taking up the pursuit, Sir Calidore effected her rescue, and bore her to the Castle of Belgard. Here she was discovered to be the long-lost daughter of the good Sir Bellamoure and his lady, Claribell. Sir Calidore, leaving Pastorella in safety with her parents, set out again to seek the Blatant Beast. He was successful so far, at least, that he captured the monster, muzzled him with iron bands, and, to the great joy of all, led him through all Fairyland. "So muzzled did the beast long remain—

Until that (whether wicked fate so framed
Or fault of men), he broke his iron chain,
And got into the world at liberty again.

Since that time none has succeeded in subduing him.

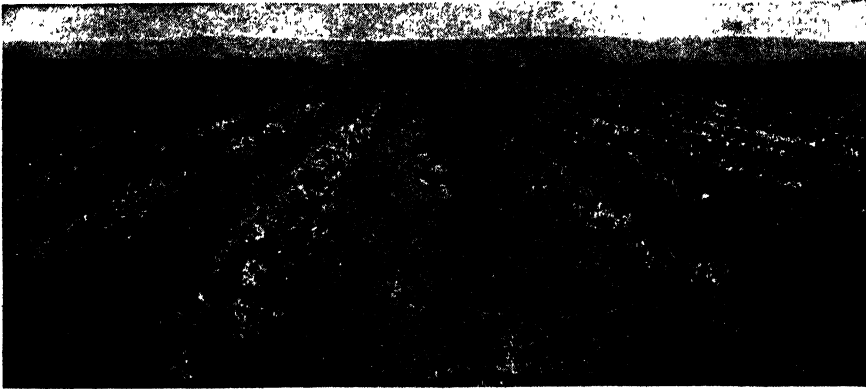
THE NEXT STORIES OF FAMOUS BOOKS BEGIN ON PAGE 901

WHERE THE WORLD'S SUGAR COMES FROM



Here we see the different sources from which the world obtains its sugar. In the circle at the top a man in India is seen climbing a tree to get the juice of a date-palm, which holds sugar. The two pictures at the bottom show the scene in a Canadian maple forest during the season for collecting the maple-juice, and a scene by the fire at which the maple-juice is being boiled down. In the centre are various kinds of sugar-cane which grow in hot countries, and at the bottom, on the left, are examples of beet, from which sugar is made. The leaves and the root of the beet are both shown. The long, thin sugar-cane in the centre is the common sugar-cane, which was at one time the only source of sugar.

The Book of FAMILIAR THINGS



In this picture we see a plantation with millions of beetroots growing for the manufacture of sugar

WHERE THE SUGAR COMES FROM

THE history of civilization might be written round the sugar-basin. We could hardly live without sugar, so important is it to us as a food and a luxury; yet not so very long ago sugar was seldom seen in the homes of the poor. So recently as fifty years ago it was extremely expensive. But the sugar-growing industry has become one of the most important in the world, and to-day, though sugar sells for much less than it did half a century ago, a greater quantity is grown than ever was known before.

Some kind of sugar is to be found in the sap of many trees, especially the maple. It is found in all fruits, and in the nectar of thousands of flowers, but it is from the sugar-cane and from the beet that we get ordinary sugar which is called sucrose.

For ages and ages the sugar-cane was the great source of supply, and it is wonderful to think that at one time all the sugar came from a single spot in the world. It would not be safe to say that it was in Bengal that the sugar-cane first grew, but it seems certain that in Bengal the process of extracting the sugar from the cane was first learned by man. Nearly 800 years before the birth of

CONTINUED FROM 660



Christ the Chinese copied the valuable art from the people of Bengal, and then, 1,600 years later, the Persians began to cultivate the sugar-cane. It was the Persian doctors who first introduced the use of sugar into medicine—a fact for which all young patients will bless them. The

Arabs, when they established colonies round about the Mediterranean, grew the cane there, and then the cane slowly made its way into Spain.

Little by little it was carried to other warm countries of the world. Missionaries took it with them, and taught natives to cultivate it; travelers carried it to the lands which they explored; and eventually sugar-cane was grown throughout the West Indies, the East Indies, the warm lands of the southern United States, in many South American countries, and elsewhere. It was the discovery of the richness of the beetroot in sugar that lessened the importance of the sugar-cane. Beet is grown in enormous quantities in Europe. Germany, Austria, France, Russia, Belgium, and the United States as well produce much beet-sugar. Attempts have been made to create a trade on the same lines in Ireland, and perhaps success will come some day.

HOW MANY KINDS OF SUGAR ARE THERE?

Suppose you were asked how many kinds of sugar there are. You might answer that you know lump sugar, granulated sugar, and powdered sugar. Perhaps your mother has in the pantry some sugar, which looks like damp sand, and which she calls "brown sugar." You know maple sugar, also, and rock candy. These answers are right so far as they go, but do not tell all, for there are dozens of kinds of sugar, and we must find out something about what sugar is.

Sugars are made up of carbon, hydrogen and oxygen combined in different proportions, and in different ways. They are found in many living things, both vegetable and animal. Peaches, grapes, and oranges are sweet because they contain sugar. So are honey and milk. Grains are partly made up of sugar. Onions, beets, peas and other garden vegetables contain sugar. As we said before, many flowers contain sugar, for which the bees eagerly seek. Not all of these sugars are alike, and sometimes the same fruit, or other substance, will contain several kinds of sugar, and all of these cannot be used for the same purposes.

Several of these sugars are valuable foods, for sugar is a real food, without which we cannot be healthy and strong. If we try to get along without it, unless we eat plenty of sweet fruits, we shall soon feel a strong craving for sugar in some form or other. Of course, we can eat too much of it, just as we can eat too much of other foods, but the right quantity is as necessary as bread. Sugar is a heat and energy producing food, and that is one reason why children are so fond of it.

Sugar obtained from milk is called milk-sugar, or lactose; that from fruit is called levulose, or fructose; that obtained from grain, potatoes, or other starchy substances is called glucose. We tell of maple sugar in another place in our book. The common sugar we know best is called sucrose, or saccharose. It is obtained principally from the sugar cane, or from the sugar beet. Let us see how it is made.

HOW SUGAR IS MADE FROM THE SUGAR CANE

Sugar cane will grow in only a few of our warmest states, such as Louisiana, or

parts of Texas, though much is also grown in the Philippines, and the Hawaiian Islands. It has a smooth, jointed stem and looks not unlike a cornstalk. It grows from six to twenty feet in height, and from one to two inches in thickness. It is a perennial; that is, the roots live and send up new stalks every year when the old are cut away, or become ripe and produce seed. In the United States the cane does not have time to produce seed before the colder weather comes, as it does in the hotter countries.

The crop which comes up from the old roots, however, does not produce as much sugar as the first crop, and the next year the yield will be even less. Since seed is difficult to get, it is the custom to plant stalks, or pieces of stalks in furrows. At every joint in the cane is a bud, which will sprout if it is kept warm and moist. From these joints young plants spring up and grow rapidly. At least a part of every plantation should be planted every year.

When the cane is ripe, it is cut off close to the ground, the leaves are stripped from the stalk, and the top is cut off. The canes are then taken to the mill, where they are often shredded, or broken, so that the heavy rollers between which the cane is crushed can force out more juice. In some places where they do not have the best ways of making sugar, the cane passes between only one set of rollers, but usually there are several sets. Between the sets the crushed cane is sprinkled with water, which helps to get out more of the sweet juice. Much of it is left in spite of all the effort. The weight of the juice left in the fibre is as great as the weight of the fibre itself. This fibre of the cane after it has passed through the rollers is called "bagasse," and much of it is burned under the evaporating pans. Many attempts to make it into paper have been made, but they have not been very successful.

HOW THE SWEET JUICE OF THE CANE BECOMES SUGAR

The juice is far from being sugar. It is a grayish or greenish liquid of which only a small part is sugar. There are many impurities which must be removed as well as much water. Some of these impurities are taken out by skimming and straining, but others are removed by adding lime and other chemicals, which

MILLIONS OF BEETS IN A SUGAR FACTORY



About nine million tons of sugar are produced every year from the beetroot. We buy abroad over fifty pounds, cane or beet, for every person. This shows millions of beets in the storage sheds, waiting to be carried by little water-channels to washing-drums. The beets roll automatically into the channels.



After being washed, the beets are carried to a machine which cuts them into strips. These strips are run into vessels, where they are treated with hot water to extract the sugar. The vessels are arranged in a circle and connected by pipes, so that the water that washes out the sugar may flow through all the vessels.

Upper picture copyright by Keystone View Co.

THE BEETROOT BEING MADE INTO SUGAR



The hot water which holds the sugar in solution is called saccharine syrup. This syrup contains many impurities, mostly tiny particles of beetroot, and it is passed into the settling-tank to stand until the impurities have sunk to the bottom. The clear syrup is then drawn off and treated in filter-presses like these.



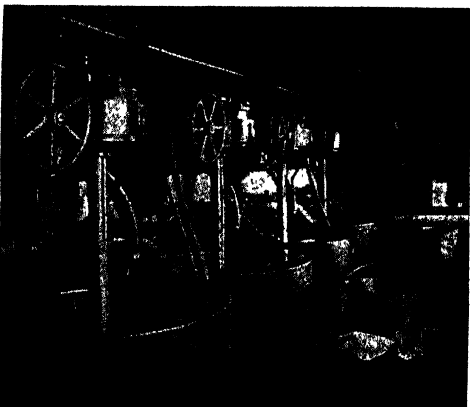
Lime plays an important part in the purifying of beet-juice. In this picture we see the kiln where limestone is burned to make it pure. Pure lime is quite white.



From the filter-presses the syrup goes to the carbonating tanks, shown here, where it is purified with a solution of lime. It is then charged with carbon dioxide.



The syrup is bleached with sulphur and again treated with lime and carbon dioxide. It is now concentrated by being heated in the huge crystalizers shown above.



The mixture of molasses and sugar from the crystalizer is thrown into a centrifugal machine which drives the molasses through holes and retains the sugar-crystals.

Two middle and lower left hand pictures copyright by Keystone View Co.

MAKING SUGAR FROM THE SUGAR-CANE



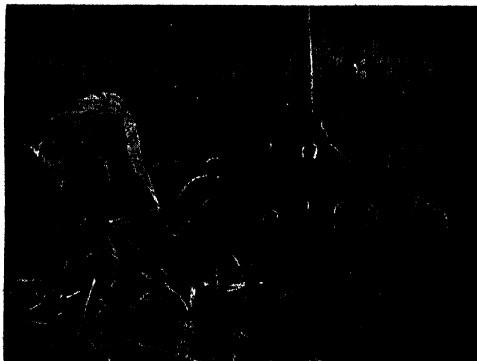
Danish people are the largest consumers of sugar in the world. They would miss nothing from their tables more than sugar. A great deal of sugar still comes from the sugar-cane, which is here being cut.



In this picture the sugar-cane that has been cut is being carted to the crushing-mills. This plantation is in the West Indies, and oxen are used to draw the carts. Formerly all the sugar used came from the cane.



An Egyptian market, where the sugar-cane is being sold just as it was cut. When the cane is crushed, it yields a greyish-green fluid, which is purified by heat.



The cane is here being crushed. The fluid that comes will be purified, and then heated till the crystals form. The crystals are then separated from the liquid.

cause the impurities to settle to the bottom. Sulphur is sometimes used to whiten the juice.

When the juice has been purified it goes to evaporating pans, where some of the water is driven off by heat. In some places this is done in open kettles, but the better mills evaporate in a vacuum, as in the salt works. Since the juice will boil at a lower temperature in a partial vacuum than in the open air, water can be driven off in the form of steam, without danger of burning the syrup. When enough water has been driven away, the thick syrup goes to the "strike pan," where more water is evaporated and the crystals of sugar are formed. Then the mass is emptied into the centrifugal machines. These are tanks which revolve very rapidly. Much of the liquid that is left, which we call molasses, is thrown out through tiny holes in the sides of the tanks.

The sugar which remains is still not the sugar you know. It is damp, sticky and not very white. Some of it is sold as brown sugar, but more goes to the refinery, where it is melted, again treated with chemicals and filtered through bone charcoal. The purified syrup is then evaporated again, and the product is the white sugar in the form of lumps, tiny grains, or fine powder which we know. Some of the molasses is sold for food, and some is again heated to get more of the sugar. Finally, much of the refuse molasses is fed to cattle or horses, which eat it greedily.

HOW SUGAR IS MADE FROM SUGAR BEETS

Though sugar cane grows only in warm countries, the other plant which gives us so much sugar can be grown much further north. The fact that some beets contain large quantities of sugar was shown by a German, Andreas Sigismund Marggraf, in 1747, but little use was made of his discovery for a long time. About 1800, one of his pupils started a small factory, and while the wars with Napoleon were going on, some sugar was made. After peace, little beet-sugar was made for many years, but for a half century or more, the quantity has been increasing very rapidly.

By careful selection of seed and good cultivation the beet has been much improved. It grows larger, contains more juice, and that juice has twice as much

sugar as the beets which were used a hundred years ago. The sugar beet is grown from seed which must be planted every year. When the beets are ripe, they are pulled out of the ground, the tops are cut off and they are taken to the factory. There they are washed, cut into small thin slices, and placed in great tanks. Hot water is forced through these tanks, and dissolves out the sugar from the slices. The syrup, which contains about the same amount of sugar as the juice of the cane, is then drawn off, and the chips are pressed to remove any syrup which is still left in them. They are fed to cattle or used as fertilizer.

The juice, or syrup, like that of the cane, is full of impurities, though they are not quite the same. It is filtered, purified, bleached, evaporated, and put through the centrifugal machines in much the same way as the cane syrup. The brown sugar from the cane is good to eat, as you know, but the raw sugar made from beets contains substances which are unpleasant, and cannot be used until it has been through the various processes in the refinery. Likewise, the molasses from the cane is good for food, but beet molasses is not. After the latter has been treated to obtain as much as possible of the sugar which still remains, what is left is worth very little.

Though the sugar cane and the sugar beet do not look at all alike, the refined sugar made from them is the same. You can be sure that the lump of brown sugar you eat came from the cane, but you do not know whether the sugar you use at breakfast came from a cane or a root.

THE UNITED STATES MUST BUY MUCH SUGAR

So you see that making sugar is not a simple matter. It is a long way from the sweet juice of the cane, or the beet, to the lump sugar on the table. That lump has perhaps come a long way. Though both sugar cane and sugar beets are grown in the United States, the country produces only a small part of what is needed. Few countries use so much sugar as the United States. The amount is about eighty-five pounds for every man, woman and child, and the merchants must bring in many million tons every year, part cane, part beet. Cuba produces the most cane-sugar, while Germany leads in beet-sugar.

THE NEXT STORY OF FAMILIAR THINGS IS ON PAGE 749.

TWO VIEWS OF A GREAT SUGAR MILL



The pictures on the other page showed the primitive methods of handling sugar cane on small plantations in the West Indies. Here is a great mill in the United States. Hundreds of loads of cane are brought here, some by wagon, and some by rail. There are many large mills in Cuba as well as in the United States.



There are several crushers like the one we see on the right. The cane is fed to the first set of rollers at the top of the picture and then passes on to the next. The rolls cannot force out all the liquid from the mass, and so the crushed cane is sprayed with water after it has gone between a set of rollers. The next set forces out a mixture of water and juice, and so on.

Pictures from Brown Bros.

THE ARAB'S FAREWELL TO HIS STEED



My beautiful ! my beautiful ! that standest meekly
by,
With thy proudly-arched and glossy neck, and dark
and fiery eye !

Fret not to roam the desert now with all thy winged
speed ;
I may not mount on thee again—thou'rt sold, my
Arab steed !

The Book of POETRY

THE LOVE OF POETRY

OF course poetry is too big a subject for us to master in a short time ; we can only hope just now to get into the way of liking to read and study it. But that is in itself a great thing to do, as youth is the time to form all good habits, and this is clearly a good one. We have already made some little progress towards becoming real lovers of poetry, and we are now to see why it is that we cannot read poetry in quite the same way as we read prose.

HOW TO READ POETRY

JUST as poetry has a different purpose from prose, is a different thing, in fact, so must we read it differently. We do not read prose, as a rule, in order to remember every word of every sentence. The reason is that in prose the story told by the words, the *thought* expressed, is what we wish to remember, rather than the *words* themselves.

With poetry it is not quite so, though even the story or the thought is still of first importance. No matter how strange, no matter how beautiful, merry or sad, the story the poet has to tell us, it must be told in words which are themselves so chosen and arranged that we can remember them and read them over again for their own charm.

Many phrases are full of poetry, by which we mean that the very words give wings to our imagination and seem to carry our thoughts into Wonderland. Tennyson, the great poet, when he was a little boy, used to be fond of repeating those simple words from one of our popular hymns, "Far, far away." They filled his mind with strange dreams of wonder, these simple little words.

If we read such a charming poem as "The Pied Piper of Hamelin," printed on pages 370-373, we shall see what is meant by the value of words in poetry. This is only a tiny story that could all be told in a hundred words. The poet takes 303 lines to tell it ; yet we would not wish it shorter. We are so pleased with the quaint words and merry phrases themselves. Here, then, is something quite different from ordinary prose, and we must read it differently.

The chief difference is not so much in the actual words, though they are very important, but in what we call the

CONTINUED FROM P. 551



rhythm. This means the movement of the verses, the pauses, stops, the rise and fall of emphasis, the quickening or the slowing of the lines. If we look at the second verse of "The Pied Piper," we shall find we have to pause in the middle of the first line and at the end of it, and again at the end of the second and third lines ; but only slightly at the end of the fourth, and not at all at the end of any of the other lines in the verse, except the last. This is how the poet contrives to quicken the movement of his story.

Think of the grand sounds that can be made by an orchestra. Well, the great poets can make us hear in imagination just such wonderful music.

We have, therefore, in reading poetry to *think* the sound of the verses, as well as the meaning of them, for the sound is part of the sense. If we altered the words we should lose something of the poet's meaning, just as we would destroy a painter's picture by putting a touch of yellow where he had put a touch of red. In prose we might alter words and phrases without injuring or destroying the writer's story.

Let us, then, try always, by giving to each word, each line and verse, its due sound and emphasis, to reproduce in our own minds the *rhythm* which the poet has intended to run through his poem like a thread of gold on which his thoughts are strung like beads. In a word, we must not *scamp* the reading of poetry, but read it slowly at first, with care, to get at the value of each phrase, its meaning, and then again more quickly to get the effect of the whole, and so many times over, for all good poetry is meant not merely to be read, but to be re-read

THE LAMB

William Blake, the writer of this curiously beautiful little poem, was born in 1757 and died in 1827. He wrote many poems full of simple beauty, but he is admired chiefly on account of his weird poems about the spiritual world, for which he himself drew many strange pictures.

LITTLE lamb, who made thee?
Dost thou know who made thee?
Gave thee life, and bade thee feed
By the stream and o'er the mead;
Gave thee clothing of delight,
Softest clothing, woolly, bright;
Gave thee such a tender voice,
Making all the vales rejoice?
Little lamb, who made thee?
Dost thou know who made thee?
Little lamb, I'll tell thee;
Little lamb, I'll tell thee;
He is callèd by thy name,
For He calls himself a lamb.
He is meek and He is mild,
He became a little child.
I a child, and thou a lamb,
We are callèd by His name.
Little lamb, God bless thee!
Little lamb, God bless thee!

LUCY

In reading poetry we should always try to be in the mood of the poet. If it is clear that he is serious, let us read him seriously. For it is very easy to make fun of serious thoughts if we care to do so. William Wordsworth was clearly serious in the following little poem, the first two verses of which are very fine; but the simple pathos of the last verse is very easily turned into parody by writers who like to make fun of the serious poets.

SHE dwelt among the untrodden ways:
Beside the springs of Dove,
A maid whom there were none to praise,
And very few to love:
A violet by a mossy stone
Half-hidden from the eye!—
Fair as a star, when only one
Is shining in the sky.

She lived unknown, and few could know
When Lucy ceased to be;
But she is in her grave, and, oh!
The difference to me!

FAIRY SONG

There is nothing so difficult to catch as a fairy! Who, indeed, did ever manage that? Nor is it easy to catch the meaning of this fairy song by John Keats, one of the great English poets. It has this lesson for us, however: not to be sad at the waning year, the withering flower, for in the heart of the tree is the sap that will feed the new buds of the next spring, and even in the winter these are already being slowly born. It is a song of hope and cheerfulness.

SHED no tear! O, shed no tear!
The flower will bloom another year.
Weep no more! O, weep no more!
Young buds sleep in the root's white core.
Dry your eyes! Oh! dry your eyes!
For I was taught in Paradise
To ease my breast of melodies—
Shed no tear.

Overhead! look overhead!
'Mong the blossoms white and red—
Look up, look up. I flutter now
On this flush pomegranate bough.
See me! 'tis this silvery bell
Ever cures the good man's ill.
Shed no tear! O, shed no tear!
The flowers will bloom another year.
Adieu, adieu—I fly, adieu,
I vanish in the heaven's blue—
Adieu, adieu!

THE SLUGGARD

Isaac Watts, who was born in 1674 and died in 1748, was a famous minister of the Gospel, who wrote many fine hymns and many very poor ones. As a poet he does not take a high rank; but he was very earnest, and always sought in his rhymes to teach good lessons. There is good teaching and a touch of humor as well in these familiar verses by him.

'TIS the voice of a sluggard; I heard him complain,
"You have waked me too soon; I must slumber again;"
As the door on its hinges, so he on his bed
Turns his sides, and his shoulders, and his heavy head.
"A little more sleep and a little more slumber;"
Thus he wastes half his days, and his hours without number.
And when he gets up he sits folding his hands,
Or walks about saunt'ring, or trifling he stands.
I pass'd by his garden, and saw the wild brier,
The thorn and the thistle grow broader and higher;
The clothes that hang on him are turning to rags,
And his money still wastes till he starves or he begs.

I made him a visit, still hoping to find
That he took better care for improving his mind;
He told me his dreams, talk'd of eating and drinking,
But he scarce reads his Bible, and never loves thinking.
Said I then to my heart: "Here's a lesson for me,"
That man's but a picture of what I might be;
But thanks to my friends for their care in my breeding,
Who taught me betimes to love working and reading.

THE NIGHTINGALE AND GLOW-WORM

William Cowper was a great lover of animals, like all people of gentle nature. In this pretty little poem he tells us of a fancy that we could wish might be true, and though it is only a fancy, we are the better for having our minds thus engaged with tender thoughts for the "lower animals."

A NIGHTINGALE, that all day long
Had cheered the village with his song,
Nor yet at eve his note suspended,
Nor yet when eventide was ended,
Began to feel, as well he might
The keen demands of appetite.
When, looking eagerly around,
He spied far off, upon the ground,
A something shining in the dark,
And knew the glow-worm by his spark;
So, stooping down from hawthorn top,
He thought to put him in his crop.
The worm, aware of his intent,
Harangued him thus, right eloquent—
"Did you admire my lamp," quoth he,
"As much as I your minstrelsy,
You would abhor to do me wrong
As much as I to spoil your song.
For 'twas the self-same power divine,
Taught you to sing, and me to shine;
That you with music, I with light,
Might beautify and cheer the night."
The songster heard his short oration,
And warbling out his approbation,
Released him, as my story tells,
And found a supper somewhere else.

THE FOUNTAIN

James Russell Lowell, the writer of these happy lines, which express so well the feeling that comes to us in watching the play of a fountain on a summer day, was a famous American poet and humorist. He was born in 1819 and died in 1891.

INTO the sunshine,
Full of the light,
Leaping and flashing
From morn till night !
Into the moonlight,
Whiter than snow,
Waving so flower-like
When the winds blow !
Into the starlight,
Rushing in spray
Happy at midnight,
Happy by day !
Ever in motion,
Blithesome and cheery,
Still climbing heavenward,
Never awary ;
Glad of all weathers,
Still seeming best,
Upward or downward
Motion thy rest ;
Full of a nature
Nothing can tame,
Changed every moment,
Ever the same ;
Ceaseless aspiring,
Ceaseless content,
Darkness or sunshine
Thy element ;
Glorious fountain !
Let my heart be
Fresh, cheerful, constant,
Upward like thee !

BOY'S SONG

There is real joy of country life in this song of rural boyhood, by James Hogg, the Scottish shepherd poet, who was known as the "Etrick Shepherd," having been born at Etrick, in Selkirkshire, in 1770. He wrote many poems, chiefly of country life, that are still favorites, and died in 1835.

WHERE the pools are bright and deep,
Where the grey trout lies asleep,
Up the river and o'er the lea,
That's the way for Billy and me.
Where the blackbird sings the latest,
Where the hawthorn blooms the sweetest,
Where the nestlings chirp and flee,
That's the way for Billy and me.
Where the mowers mow the cleanest,
Where the hay lies thick and greenest,
There to track the homeward bee,
That's the way for Billy and me.
Where the hazel bank is steepest,
Where the shadow falls the deepest,
Where the clustering nuts fall free,
That's the way for Billy and me.
Why the boys should drive away
Little sweet maidens from the play,
Or love to banter and fight so well,
That's the thing I never could tell.
But this I know, I love to play,
Through the meadow, among the hay ;
Up the water and o'er the lea,
That's the way for Billy and me.

THE BURIAL OF SIR JOHN MOORE

Sir John Moore was a great soldier who won the battle of Coruna, in Portugal, on January 16, 1809, but was killed on the battlefield. This solemn, dignified poem, describing his burial, was written by an Irish clergyman, Charles Wolfe, who died in 1823, and, although he wrote other poems, this is the only one that is remembered ; but it is sure to live for ever.

NOT a drum was heard, not a funeral note,
As his corse to the rampart we hurried ;
Not a soldier discharged his farewell shot
O'er the grave where our hero we buried.
We buried him darkly, at dead of night,
The sods with our bayonets turning ;
By the struggling moonbeam's misty light,
And the lantern dimly burning.
No useless coffin enclosed his breast,
Not in sheet or in shroud we wound him ;
But he lay like a warrior taking his rest,
With his martial cloak around him.
Few and short were the prayers we said,
And we spoke not a word of sorrow ;
But we steadfastly gazed on the face that was dead,
And we bitterly thought of the morrow.
We thought, as we hollowed his narrow bed,
And smoothed down his lonely pillow,
That the foe and the stranger would tread
o'er his head,
And we far away on the billow !
Lightly they'll talk of the spirit that's gone,
And o'er his cold ashes upbraid him ;
But little he'll reck, if they let him sleep on
In the grave where a Briton has laid him.
But half of our heavy task was done
When the clock struck the hour for retiring ;
And we heard the distant and random gun
That the foe was sullenly firing.
Slowly and sadly we laid him down
From the field of his fame fresh and gory ;
We carved not a line, and we raised not a
stone—
But we left him alone with his glory.

ALL'S RIGHT WITH THE WORLD

This is a splendid outburst of joy at the goodness of God. In these eight short lines Robert Browning has done more than others in long poems to convey the delight of being alive that comes to us on a beautiful morning in spring.

THE year's at the spring
And day's at the morn,
Morning's at seven,
The hill's side's dew-pearled,
The lark's on the wing,
The snail's on the thorn,
God's in His heaven—
All's right with the world.

THE RAINBOW

In this little poem by Wordsworth occurs the famous line "The Child is father of the man," which means that, what our character is in childhood, so will it be when we grow up.

MY heart leaps up when I behold
A rainbow in the sky ;
So was it when my life began,
So it is now I am a man,
So be it when I shall grow old,
Or let me die !
The Child is father of the man ;
And I could wish my days to be
Bound each to each by natural piety.

THE ARAB'S FAREWELL TO HIS STEED

The Arab's devotion to his friend, the horse, is famous. But who, indeed, that is not a brute can fail to love his faithful horse, which serves him meekly and will always do its best for its master? The Hon. Mrs. Norton, one of the three lovely daughters of Richard Brinsley Sheridan, the dramatist, chose a fine subject in this poem, and she treated it with dramatic fitness and true feeling. It is a good poem to recite.

MY beautiful! my beautiful! that standest meekly by,
With thy proudly-arched and glossy neck, and dark and fiery eye!
Fret not to roam the desert now with all thy winged speed:
I may not mount on thee again—thou'rt sold, my Arab steed!

Fret not with that impatient hoof, snuff not the breezy wind,
The farther that thou fliest now, so far am I behind.

The stranger hath thy bridle rein—thy master hath his gold;
Fleet-limbed and beautiful, farewell!—thou'rt sold, my steed, thou'rt sold.

Farewell! Those free, untired limbs full many a mile must roam,
To reach the chill and wintry sky which clouds the stranger's home.
Some other hand, less fond, must now thy corn and bed prepare;
The silky mane I braided once must be another's care.

The morning sun shall dawn again, but never more with thee
Shall I gallop o'er the desert paths, where we were wont to be;
Evening shall darken on the earth, and o'er the sandy plain
Some other steed, with slower step, shall bear me home again.

Yes, thou must go! The wild, free breeze, the brilliant sun and sky,
Thy master's home—from all of these my exiled one must fly.
Thy proud dark eye will grow less proud, thy step become less fleet,
And vainly shalt thou arch thy neck thy master's hand to meet.

Only in sleep shall I behold that dark eye glancing bright;
Only in sleep shall hear again that step so firm and light;
And when I raise my dreaming arm to check or cheer thy speed,
Then must I, starting, wake to feel—thou'rt sold, my Arab steed.

Ah! rudely then, unseen by me, some cruel hand may chide,
Till foam-wreaths lie, like crested waves, along thy panting side;
And the rich blood that's in thee swells in thy indignant pain,
Till careless eyes, which rest on thee, may count each starting vein.

Will they ill-use thee? If I thought—but no, it cannot be,
Thou art so swift, yet easy curbed; so gentle, yet so free;
And yet, if haply, when thou'rt gone, this lonely heart should yearn,
Can the hand that casts thee from it now command thee to return?

Return!—alas, my Arab steed! what shall thy master do,
When thou, who wert his all of joy, hast vanished from his view?
When the dim distance cheats mine eye, and through the gathering tears
Thy bright form, for a moment, like the false mirage appears?

Slow and unmounted shall I roam, with weary step alone,
Where with fleet step and joyous bound thou oft hast borne me on;
And, sitting down by that green well, I'll pause and sadly think,
" 'Twas here he bowed his glossy neck when last I saw him drink!"

When last I saw thee drink!—away! The fevered dream is o'er!
I could not live a day and know that we should meet no more!
They tempted me, my beautiful! for hunger's power is strong—
They tempted me, my beautiful! but I have loved too long.

Who said that I had given thee up? Who said that thou wert sold?
'Tis false!—'tis false! my Arab steed! I fling them back their gold!
Thus, thus, I leap upon thy back, and scour the distant plains!
Away! who overtakes us now may claim thee for his pains!

THE UNSEEN PLAYMATE¹

Robert Louis Stevenson in this poem, which is reprinted from "A Child's Garden of Verses" by permission of Messrs. Longmans, Green & Co., has written a beautiful piece of fancy. He almost makes us see this unseen playmate. He means, of course, the gentle spirit of happiness and of true childhood joy, which makes each little boy or girl never feel lonely, as it should be present in each one.

WHEN children are playing alone on the green,
In comes the playmate that never was seen.
When children are happy and lonely and good,
The Friend of the Children comes out of the wood.

Nobody heard him and nobody saw,
His is a picture you never could draw;
But he's sure to be present, abroad or at home,
When children are happy and playing alone.

He lies in the laurels, he runs on the grass,
He sings when you tinkle to musical glass;
Whene'er you are happy and cannot tell why;
The Friend of the Children is sure to be by!

He loves to be little, he hates to be big,
'Tis he that inhabits the caves that you dig;
'Tis he, when you play with your soldiers of tin
That sides with the Frenchmen, and never can win.

'Tis he, when at night you go off to your bed,
Bids you go to your sleep and not trouble your head;
For wherever they're lying, in cupboard or shelf,
'Tis he will take care of your playthings himself!

¹ From "Poems and Ballads," copyright, 1895, 1896, by Charles Scribner's Sons.

THE STARS

In the poem "The Star," printed on page 1156, we have verses written specially for children. But Barry Cornwall, whose real name was Bryan Walter Proctor, wrote this little poem of "The Stars" for all readers young or old. In it he has caught the quiet beauty of the night, and you will notice that instead of expressing wonder as to what the stars may be, he is content to think of them as among the glories of God's world, that fill our souls with reverence and peaceful joy.

THEY glide upon their endless way,
For ever calm, for ever bright,
No blind hurry, no delay
Mark the Daughters of the Night;
They follow in the track of Day,
In divine delight.

And oh! how still beneath the stars
The once wild, noisy Earth doth lie;
As though she now forsook her jars,
And caught the quiet of the sky.
Pride sleeps; and Love (with all his scars)
In smiling dreams doth lie.

Shine on, sweet orb'd souls, for aye,
For ever calm, for ever bright:
We ask not whither lies your way,
Nor whence ye came, nor what your light.
Be, still—a dream throughout the day,
A blessing through the night!

EXCELSIOR

Written by the famous American poet, Henry Wadsworth Longfellow, this poem may seem strange at first reading. We must know that the word "excelsior" comes from a Latin word meaning "ever upward": then the poem is quite clear. The youth wished to excel, and he heeded no warnings, no inducements to remain in comfort and safety, but went striving upward and at last suffered death in the snowstorm. But to the end he stood by his motto, which is a noble one, and, whether we fail or succeed, it is always a noble thing to try to excel. That is the real meaning of the poem.

THE shades of night were falling fast,
As through an Alpine village passed
A youth, who bore, 'mid snow and ice,
A banner with the strange device:
Excelsior!

His brow was sad; his eye beneath
Flashed like a falchion from its sheath,
And like a silver clarion rung
The accents of that unknown tongue:
Excelsior!

In happy homes he saw the light
Of household fires gleam warm and bright:
Above, the spectral glaciers shone,
And from his lips escaped a groan:
Excelsior!

"Try not the pass!" the old man said,
"Dark lowers the tempest overhead,
The roaring torrent is deep and wide!"
And loud the clarion voice replied:
Excelsior!

"O stay!" the maiden said, "and rest
Thy weary head upon this breast!"
A tear stood in his bright blue eye,
But still he answered with a sigh:
Excelsior!

"Beware the pine-tree's withered branch!
Beware the awful avalanche!"
This was the peasant's last good-night!
A voice replied, far up the height:
Excelsior!

At break of day, as heavenward
The pious monks of Saint Bernard
Uttered the oft-repeated prayer,
A voice cried through the startled air:
Excelsior!

A traveller, by the faithful hound
Half buried in the snow, was found,
Still grasping in his hand of ice
That banner, with the strange device:
Excelsior!

There, in the twilight cold and grey,
Lifeless, but beautiful, he lay,
And from the sky, serene and far,
A voice fell, like a falling star:
Excelsior!

YE MARINERS OF ENGLAND

When Thomas Campbell wrote this famous song, one of the finest patriotic songs in any language, all warships were still made of wood—England's "wooden walls" they were called—but though they are now built of massive steel plates, the feeling that inspires the brave sailors is still the same as in the days of Nelson, who won the great battle of Trafalgar when the poet Campbell was 28 years of age.

YE mariners of England,
That guard our native seas;
Whose flag has braved, a thousand years,
The battle and the breeze!
Your glorious standard launch again,
To match another foe!
And sweep through the deep,
While the stormy winds do blow;
While the battle rages loud and long,
And the stormy winds do blow.

The spirit of your fathers
Shall start from every wave!—
For the deck it was their field of fame,
And ocean was their grave:
Where Blake and mighty Nelson fell,
Your manly hearts shall glow,
As ye sweep through the deep,
While the stormy winds do blow;
While the battle rages loud and long,
And the stormy winds do blow.

Britannia needs no bulwarks,
No towers along the steep;
Her march is o'er the mountain waves,
Her home is on the deep.
With thunders from her native oak
She quells the floods below,
As they roar on the shore,
When the stormy winds do blow;
When the battle rages loud and long,
And the stormy winds do blow.

The meteor flag of England
Shall yet terrific burn;
Till danger's troubled night depart,
And the star of peace return.
Then, then, ye ocean warriors,
Our song and feast shall flow
To the fame of your name,
When the storm has ceased to blow;
When the fiery fight is heard no more,
And the storm has ceased to blow.



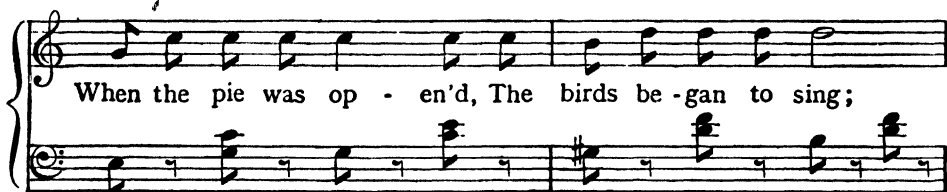
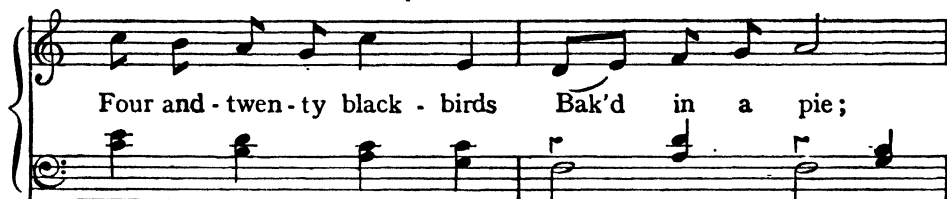
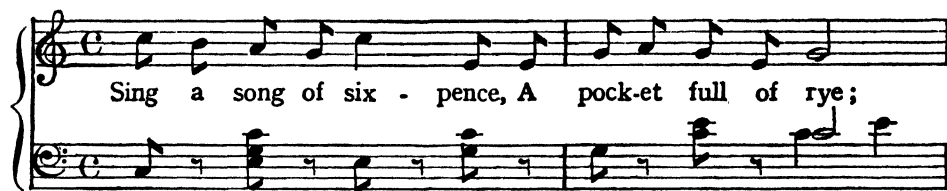
SING A SONG OF SIXPENCE

SING a song of sixpence,
A pocket full of rye;
Four-and-twenty blackbirds
Bak'd in a pie;

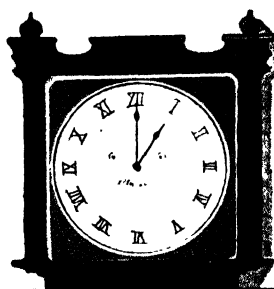
When the pie was open'd,
The birds began to sing;
Was not that a dainty dish
To set before a king?

The king was in his counting-house,
Counting out his money;
The queen was in the parlour,
Eating bread and honey;

The maid was in the garden
Hanging out the clothes,
Down came a blackbird
And snapped off her nose.



Hickory, Dickory, Dock.



HICKORY, DICKORY, DOCK

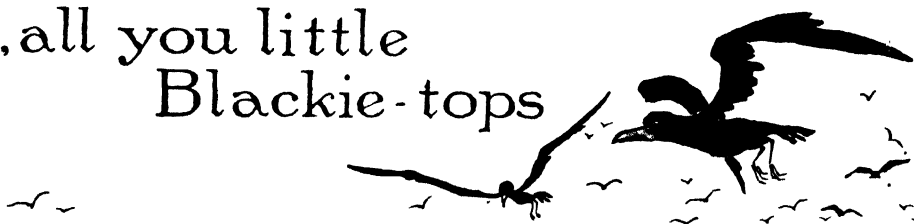
Hick-o-ry, Dick-o-ry, Dock, . . The mouse ran up the clock, The

clock struck one, The mouse ran down, Hick-o-ry, Dick-o-ry, Dock



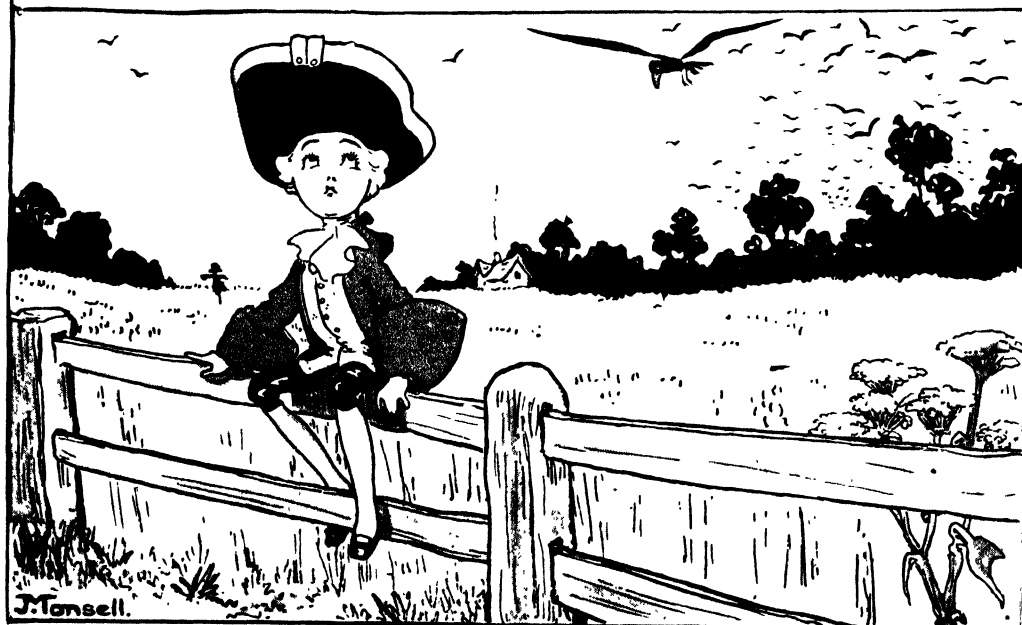
Monsell

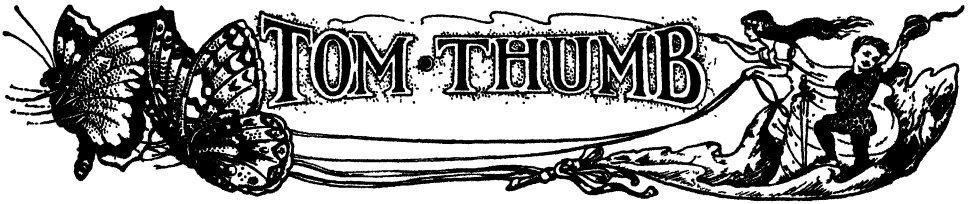
O, all you little
Blackie-tops



O, all you little Blackie-tops,
Pray do not eat my Father's crops
While I lie down to take a nap.
Shua O! Shua O!

If Father he perchance should come
With his cocked hat and his long gun,
Then you must fly, and I must run.
Shua O! Shua O!





CONTINUED FROM PAGE 580.

NOT far from Fairyland lived a man and his wife who were often sad because they had no child.

They looked so gentle and kind-hearted that the wizard Merlin thought he would go and see if they really deserved to be happy. So one day he dressed himself in an old ragged coat and knocked at their door.

"Come in," said the old woman. "Won't you sit down and rest a little? We are very poor, but I am preparing some bread and milk for my husband's dinner, and I will make you some too."

"That is very kind of you," answered the old man, throwing off his cloak. "I am the wizard Merlin, who can do all things, and because you have been generous and thoughtful for others I will make you a gift. You may choose what it shall be."

"Oh, please," cried the old woman,

"we want a little child! Even if it were no bigger than my thumb we shouldn't mind."

"Very well," said the wizard, smiling, and he went away.

When the man and his wife woke up the next morning there lay beside them a little child, a boy, so tiny that he really was no bigger than his mother's thumb. When the fairy godmother came she told the old people that he would never grow any bigger. So they called him Tom Thumb.

Tom was so small that his godmother had to call for the help of the other fairies to make him a suit of clothes.

They made him a shirt out of a cobweb, a coat of a beetle's wing, shoes of the skin of a mouse, and a cap out of an oak-tree leaf. When everything was ready Tom's godmother gave him a little magic sword, which she told him he must always wear.



TOM THUMB BEFORE THE KING AND QUEEN

Tom was a good boy, but he had one bad fault: he was very inquisitive. One day, when his mother was making a pudding, there came a knock at the door, and she went to see who was there. She was away so long that Tom began to wonder what was inside the bowl that his mother had been stirring.

He got off his chair, which always stood on the table, and walked round and round the basin, wishing that he could see over the top. By the side of the basin lay a fork.

"Hurrah!" cried Tom, seizing the fork. "This will make a capital ladder."

And he climbed up the prongs until he could reach the top of the basin. But even then he could hardly see in, for his head only just reached the top.

"I know," said he, "I'll jump."

Tom put both hands on the edge of the basin and jumped. He jumped once, but not quite high enough; he jumped again, but still he could not see. So he jumped a third time, and this time he jumped right into the basin.

At this moment his mother came back, and, taking up the big wooden spoon, was about to stir it again, when she saw something moving in the basin. This so frightened her that she took up the basin and threw everything in it as far as she could out of the window.

Underneath the window flowed a river, and as Tom tumbled headlong into it a big fish came swimming by. The fish opened his mouth and—in fell Tom.

The fish was caught, and it was so fine a fish that it was taken to the palace for the King's dinner. As the cook cut open the fish out jumped Tom upon the table. When the King heard of it, he was so astonished that he ordered Tom to be brought before him.

"Where do you come from, and what is your name?" asked the King, putting on his glasses and looking down at him.

Tom told his story, and the King was so pleased that he allowed Tom to stay with him and live in the palace.

It was all very splendid, and for a long time Tom enjoyed himself and

was very happy. When the King went for a ride, Tom went too, only, instead of a horse, Tom rode on the back of a great rat.

As they were riding in the forest one day, a big cat sprang out, and, pouncing on the rat and its rider, carried them off into a tree. Tom took out his magic sword, and after a brave fight he killed the cat. Then he turned and began to climb down the tree. But it was a long way for little Tom's legs, and he had not got far when he felt his foot slipping, and in a minute he would have fallen and been killed. Just then, however, the King missed Tom, and, looking round, he was just in time to catch him as he fell.

Tom had had such a fright that, when he got back to the palace, he felt quite ill and had to go to bed. In the morning the King came to his bedside and found him very miserable.

"What is the matter?" asked the King.

"I want to go home," sobbed Tom.

"Nonsense!" said the King. "You have everything you can ask for, and you ought to be very happy."

"I want my mother. Please let me go home."

"Certainly not!" said the King. "You must stay here till I am tired of you."

"Oh dear!" sighed Tom. "And when will that be?"

"I don't know," said the King. "I like you very much at present."

All that day Tom wondered how he could get away without being caught; and the more he wondered the more miserable he became, and the more he wanted his mother.

He worried so that he became thin and ill, and at last his fairy godmother, thinking that he had been punished enough for his inquisitiveness, determined to help him. So she went to Tom's bedside, and when Tom, jumping for joy, begged her to take him home, she consented. Her carriage was waiting on the window-sill. They got in, and away they sailed, over the house-tops, till they came to the cottage where Tom lived.

When they saw Tom again, his father and mother cried for joy, and they all lived happily together for the rest of their lives.

THE LAND OF THE RED DAISIES

A FAIRY and a witch fell out about a magic ring, and they came to the young and handsome King of the country and asked him to decide to which of them the ring belonged. The fairy said the witch had stolen it from her, and the witch said that she had bought it from a magician in the Land of The Red Daisies.

The King looked at the ring, and, finding no name upon it, he handed it to the witch, and said :

"Let me see what enchantment you can work with it."

The witch rubbed the ring, and nothing wonderful appeared.

The King then handed the ring to the fairy, and she kissed it and touched his silver throne with it, and the throne turned into pure gold.

"Rings belong to those who can use them," said the King, giving the ring to the fairy.

"And asses' heads belong to those who deserve them," said the witch, touching the King with her wand.

The courtiers gave a cry of horror. The King had become a man with an ass's head. But the fairy said to him :

"Love can cure the effects of hate.

Marry at once a sweet and trustful wife, and the spell will soon be removed."

The King then commanded all the young girls in the country to assemble before his palace so that he might choose his bride. He looked at each of them in turn, and each of them in turn started back in disgust at the sight of his ass's head, and in sadness he dismissed them. But as he slowly left the place, he saw someone move behind a tree, and there he found a pretty beggar-maid, who, being barefooted and in rags, had been ashamed to stand among the other girls. Yet the King looked at her, and, finding that her eyes were full of pity, shyness, and love, he exclaimed : "You shall be my Queen."

He appointed ten maids of honor to array her in beautiful robes and glittering jewels, and then he led her to the cathedral, where they were married.

"Now," he said, "do not seek to know anything about me until to-morrow morning, and then you shall know everything."

But in the night the young Queen touched her husband's head and felt



The King, who had become a man with an ass's head, called all the young girls before him. He looked at the beggar-maid, whose eyes were full of pity, shyness, and love. "You shall be my Queen," he said.

that he had a human face; and she got up and lighted a candle and looked at him. Yes, it was true! The ass's head had disappeared, and he was a young and handsome man again. Then, alas, her movement of joy shook the candle, and as a drop of burning wax fell upon her husband's hand, he awoke and said:

"Unhappy girl! To-morrow morning the spell would have been entirely removed. Now the witch has regained her power over me, and I must go and live with her in the Land of The Red Daisies."

In a moment he was gone; but the young Queen felt that she could not live without him, and set out to find the Land of The Red Daisies.

Outside the palace she met the fairy.

"Please show me the way to the Land of The Red Daisies," she said.

"That is the place where the witch lives," said the fairy, "and I have never been there. But take my magic ring, and it will, perhaps, help you."

And so it did. The young Queen had only to kiss it and touch a stone with it, to obtain gold with which to buy food and lodging. In this way she wandered to the end of the country and came to a hut on the edge of a great desert. In the hut was a little old woman, and the young Queen said to her:

"Please show me the way to the Land of The Red Daisies."

"I do not know where it is," said the little old woman, "but my pig often goes there and comes back laden with precious things. It departs suddenly, and I can never tell when it is about to go."

"Very well," said the young Queen, "I will sleep beside your pig, and wait until it sets out for the Land of The Red Daisies, and then follow it."

She lay down in her beautiful robe in

the straw beside the pig. In the middle of the night the pig shook itself and ran out, and she followed it, and came through the great desert into a strange, red land. The daisies were red, and the grass was red, and the leaves of the trees were red, and amid the trees stood a strange, red palace.

She tied the pig to a tree, and in the wood she met a ragged peasant girl, whom she persuaded to change clothes with her. Then she went to the red palace and was engaged as a maid.

"You must work very hard and help me to get the feast ready," said the cook. "Our mistress is a witch, and her daughter is about to marry the King of the country beyond the great desert."

"That is my husband," said the young Queen to herself, and, going upstairs, she peeped into the room where he was sitting, and saw that it was so.

She dared not speak to him while daylight lasted, and when her work was done, she lay down on her lowly bed till midnight came. Then, in the darkness, she crept to his room, and, lighting a candle, gently wakened him. At first he did not recognize her, but, when she had touched him with the fairy ring, he remembered, and, taking her hand he led her down the stairs, and out under the starry sky. Soon they reached the tree to which the pig was tied, and as it was very hungry, as soon as it was released it set out for home. They



followed it in the moonlight, across the desert, and at daybreak came to their own country, where they lived in peace and happiness ever after.

THE WITCH OF THE FOREST TREE

PRINCE MIRKO was the son of a King of Hungary who had died fighting in a battle with the Tartars. Mirko was forced to fly for his life, and after riding for seven days he came to a palace made of diamonds. It was a dark night, and Mirko was tired and hungry. So he boldly entered the gate of the palace, and was astonished to find no one living in it. There was an excellent dinner in the dining-room, and, after eating, Prince Mirko went into a bed-room and lay down to sleep. But he had scarcely closed his eyes when seven great, fierce Tartars came thundering into the palace.

"Ho, ho," cried the tallest of the Tartars, "I smell Christian blood!" And, rushing upon Mirko, he hacked him into little pieces, and threw them out of the window. The next morning a lovely girl crept from a hiding-place beneath the palace and poured over the pieces the water of life. Mirko at once sprang up, stronger and handsomer than before, and the lovely girl disappeared.

"Ho, ho," cried the tallest of the Tartars, "the little Prince has come to life!" And he hacked Mirko again into little pieces. The second morning the same thing happened. But on the third morning, when the lovely girl again poured the water of life upon Mirko, she said to him: "I am the Princess of this castle. The Tartars have killed my father. But I need hide no more, for you are stronger than them all."

So, indeed, he was. With one stroke of his sword he killed the seven Tartars, and he and the Princess set out to find their fathers and pour upon them the water of life. At night they entered a forest, and lighted a fire beneath a tree.

"How cold it is!" said a voice overhead.

They looked up, and saw a Tartar witch sitting in the tree.

"Throw this powder on the fire," said the witch, "and it will burn better."

Mirko did so, and a strange smoke arose, and the witch descended, saying:

"You killed my children, the seven Tartars. Now it is your turn to die!"

Mirko felt the magic stealing over him, and called on the Princess to help him. But the strange smoke had over-



The Prince and Princess lighted a fire in a forest. "How cold it is!" said a voice overhead. They looked up and saw a witch in the tree.

come her. Mirko carried the water of life, and he poured some quickly over her, and over himself, and they then caught the witch and forced her to lead them to where their fathers were buried.

"I seem to have slept a long time," said the old King, rubbing his eyes, as the water touched him. The Princess's father said the same thing.

Soon afterwards Mirko married the Princess, and his father gave up his throne and made them King and Queen.

THE EAGLE-GIRL OF THE MOUNTAINS

ONE morning a potter's wife in Northern India went to the mountains to get some clay that her husband needed, and with her took her little baby girl.

On reaching the mountains she put the child down, and turned to look for the clay; and a great eagle then swooped down and carried the child to his nest. But the little girl was not afraid of him. She clung to his neck and laughed and played, and so won his heart that he resolved to adopt her as his daughter. He fed her on fruits, and nuts, and wild honey, and taught her to climb about the mountain-top.

At first he stole peasant's clothes for her from the villages in the plain. Then, as she became older, he determined that she should wear princely robes, and flew into the King's palace, and took one of the old Queen's gowns. She soon wore it out in clambering about the rocks, and he had to steal so many dresses for her that the Queen told her son to kill the eagle.

The Prince, however, did not want to

kill it at once. He wondered what a bird could possibly do with dresses, and resolved to find out.

He climbed for months about the mountains, and at last he heard a girl singing sweetly above him, and, clambering up, he found her sitting in the eagle's nest. Her beauty fascinated him, and after listening to the wonderful story of her life he begged her to come down to the palace and be his wife. She went down with him, and the Prince brought her to his father, the King, and told him all that had happened. The King kissed the beautiful Eagle-Girl, and ordered preparations to be made for the wedding.

But the old Queen, who did not want her son to marry a strange girl, told two men to take the bride away and throw her into the river. They did so, but the eagle heard her cries, and brought her back to the palace. The next day she was married to the Prince; and, to punish the Queen, the King retired from the throne, and the Eagle-Girl became Queen.



The Prince heard a girl singing sweetly above him. He clambered up and found the beautiful Eagle-Girl.

THE COBBLER AND THE ELVES

HANS STUMPIE was a cobbler who lived with his wife in the Forest of Thuringia, in Germany, where all the countryfolk wore wooden shoes.

As Hans made only leather shoes, he had a hard task to get a living, and things went from bad to worse, and at last he had nothing left in the house but a bit of leather scarcely large enough to make one pair of shoes. Hans cut the leather out very carefully, and went to bed.

When he came down in the morning —oh, wonder of wonders!—there, on

wife sat up to see who it was that made the shoes, and at midnight in jumped two wee men, who squatted down on the board, and taking up the pieces of leather, sewed away so quickly that Hans and his wife could not follow the movements of their hands. When all the work was done, the two wee men went away.

The next morning Hans' wife said to him:

"Now that the two wee men have made us rich, we must do something for them. I have it! I will make them some clothes, and you must make them some shoes."



TWO TINY MEN CAME IN THE NIGHT AND CUT UP THE COBBLER'S LEATHER

the board, were the shoes already made. And a customer came in and bought them at a good price, and with the money Hans got some food and also purchased a larger piece of leather. He cut this out into the stuff for two pairs of shoes, and in the morning he found the two pairs made, and he sold them in the course of the day.

Then he purchased leather enough for four pairs of shoes, and cut them out, and in the morning there were four pairs made. So it went on. No matter how many pairs he cut out overnight, they were all made for him the next day. And the end was that he became a very prosperous man.

Just before Christmas, Hans and his

So the next night Hans and his wife put the clothes and shoes on the board for the little creatures, and watched to see what they would do. The two wee men were at first astonished to find that no leather had been cut for them to work on. Then they saw the clothes and shoes, and put them on, and danced merrily about the room, singing:

"Neat and natty boys are we;
Cobbler's elves no more we'll be."

They hopped over the chairs, they hopped over the tables, and at last they hopped out of the window, and they never came back. But Hans always prospered in his work, and he and his wife lived in ease and happiness all the rest of their lives.

THE BOY AT THE GIANT'S CASTLE

MANY years ago a boy wandered about the New Forest looking for some strayed sheep, and came to a giant's castle.

"I've eaten your sheep," roared the giant, "and if you're not careful I'll eat you. See how strong I am!" Saying this he took up a rock and squeezed it to bits.

"But can you wring water out of a stone?" said the boy. "See how much stronger I am!" And, taking a piece of cheese out of his pocket, he pressed it until the whey ran out.

The giant was wonder-struck, and asked the boy to help him get some firewood. He found a great oak, and

"If I don't kill this mighty creature to-night," muttered the giant, "he will master me in the morning."

But the boy was too wide awake to go to sleep. He soaked his bolster with water, and put it in his bed, and waited behind the door. At midnight the giant entered and struck a blow at the bolster; then, as the water spurted into his face, he went away, saying:

"Ha! That knocked all the blood out of him!"

The next morning the boy came gaily downstairs, and said that a flea had bitten him in the night. The giant looked at him in terror. When break-



THE BOY JUMPED INTO THE TREE, AND THE GIANT STAGGERED UNDER THE BURDEN

bent it down, and told the boy to hold it while he cut it. But when the boy tried to do so, the tree sprang up and sent him flying through the air.

"That's a favorite trick of mine," said the boy. "Can you leap as high as that?"

The giant would not try. When he had felled the oak, the boy said:

"The root end's the heavier, so I will take that. You take the top end."

When the tree was balanced on the giant's shoulder, the boy jumped up and hid in the branches. The giant groaned under the burden, and, staggering into the castle yard, threw down the tree wearily, and the boy leaped off and pretended that he had just let the root end fall.

"Surely you're not tired," said the boy. "I'm as fresh as when we started"

fast came, he was still more terrified to see how much porridge the boy swallowed, and how fat he grew.

"How do you manage to eat so much?" he said.

"Well," said the boy, "after eating all I can, I cut myself open, and then begin to eat again."

The boy had tied the bolster-cover round his neck, under his clothes, and he poured the porridge there, instead of eating it. He now cut open the bolster-cover, and let out the porridge.

"That's really a good trick," said the giant. So, taking a great carving knife, he stabbed himself, and fell down dead, and the boy then became master of the castle and lord of its treasures

THE NEXT STORIES ARE ON PAGE 791.

THINGS TO MAKE AND THINGS TO DO

WHAT THESE PAGES TEACH US

THESE pages begin with more instructions for our toy Zoo, which began on page 619, where we learned how to make a cat. By placing a piece of tissue-paper over these patterns you can draw the patterns quite easily, so as to be able to cut them out without spoiling the book. We continue the building of Modeltown by making a large shop, for which instructions and plans begin on page 615. With our girl's work-basket we learn how to proceed with the dressing of a doll; our gardener tells us what to do in the middle of May; and the games on page 735 are specially suited to the fine weather of May.

CONTINUED FROM PAGE 624.

A LION AND TIGER FOR OUR TOY ZOO

THIS time we are going to add a lion and a tiger to our Zoo. Our lion is made of smooth beaver cloth that will not fray.

After the pattern is all cut out, there will be seven pieces: two upper halves (the whole outline) to face each other, two under halves to face, one nose piece, one tail piece, and the ear. Get the nose piece in place first.

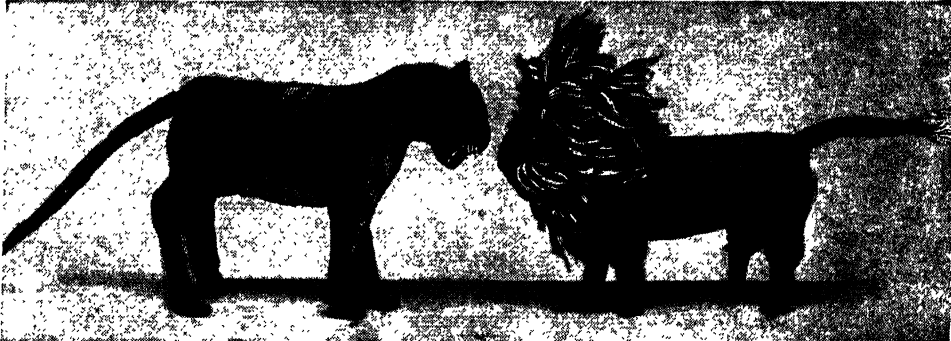
Now look at the diagram on page 728 and observe the following instructions.

Put x to x on the animal's head, and stitch carefully right down to v . The two edges are quite a different shape, but take no notice of this, go straight on, and make them come together. When you get down to point v , fasten off the thread. Then put the throat part of the two halves together,

from slipping out, and at the other end round off the edge of the extra half an inch, sew four or five stitches round it to keep it folded together (these stitches will represent the lion's toes), and catch it back with a stitch or two at right angles with the leg, so as to form a foot.

Now push each of these legs into one of the holes left for them, leaving about three-quarters of an inch showing of the front legs and half an inch of the back ones, and make the feet turn the right way.

Having made sure that all the legs are the same length and in good position, sew down the edge of the cloth of the upper part of leg on to the under-leg. As it is thick and firm it will not need to be turned in. The upper



THE LION AND TIGER FOR OUR TOY ZOO, MADE AS DESCRIBED IN THESE PAGES

and stitch up till you come to where you left off. Then go up the other side of the nose to x again. Next get the two under halves in place, as they are the exact shape of the upper halves which they fit.

Leave the openings for the legs open. Next stitch from x on the top of the head right down the back to where the under parts are joined on. The shape can now be filled, beginning at the head.

Now take four pieces of wood, one and a quarter inches long and about as thick as a thin slate-pencil, and cut four pieces of cloth, each half an inch longer than the wood and wide enough to wrap it in comfortably. Sew each piece of wood into a piece of cloth, bringing the edge of the cloth to the end of the wood at one end, and taking a thread or two of cotton over to keep the wood

part of the back legs will seem a little too large. This is quite as it should be; it is to be sewn up to look like the big joint of the hind leg. If the front ones also seem too large, the extra piece can be disposed of in the same way.

The tail piece of cloth must be rolled up till it is as thin as a pipe, and sewn along with a tuft of mending worsted to match the cloth fastened in at the end. Round the corners off at the other end, and hem neatly into the proper position. The nostrils are marked by stitches of black worsted in the seams of the nose; the mouth goes grimly across the chin in the way shown in the little sketch on the next page. The eyes should be made of amber beads or sequins. The mane, which goes all round the face and head, leaving only the nose and

THINGS TO MAKE AND THINGS TO DO

chin showing, is made of worsted to match the cloth, sewn on in tufts of half a dozen strands, three inches long, doubled. The ears, almost hidden by the mane, are shaped like the cat's ears, but as the cloth will not fray, a single thickness will do.

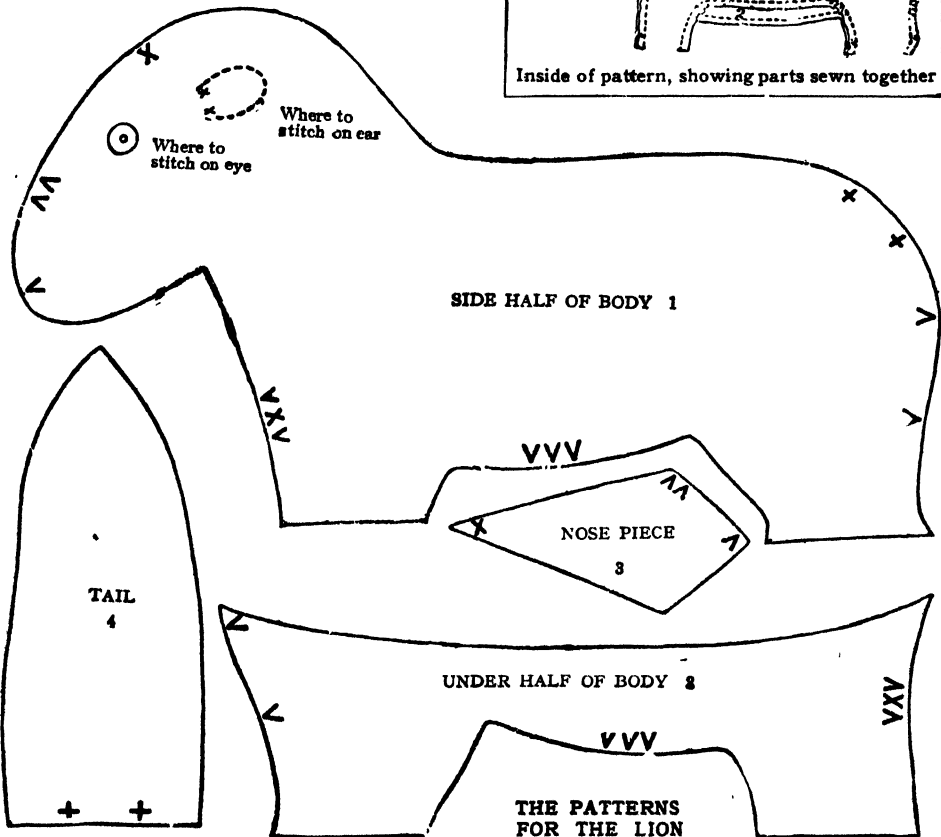
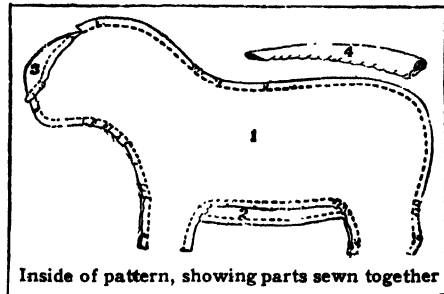
The tiger is made in very much the same way as the lion, but of orange-brown velvet. A quarter of a yard is ample. The chief difference is in the legs, as velveteen is not too thick to turn, and cannot be left raw-edged. The wood for the front legs must be one and a half inches long; for the back legs, one and three-quarter inches only, as in the hind legs it is only to reach the big joint. Cover the wood with velvet, forming the paws in the same way as in the lion, and push it up the "trouser-legs"

waiting for it. It should meet the stuffing in the body, and, in the case of the front legs, be embedded in it, so as to prevent the wood from showing at the shoulder. It is sometimes well to leave an opening in the underseam till quite the last, that a piece of extra stuffing may be pushed into the thighs if necessary.



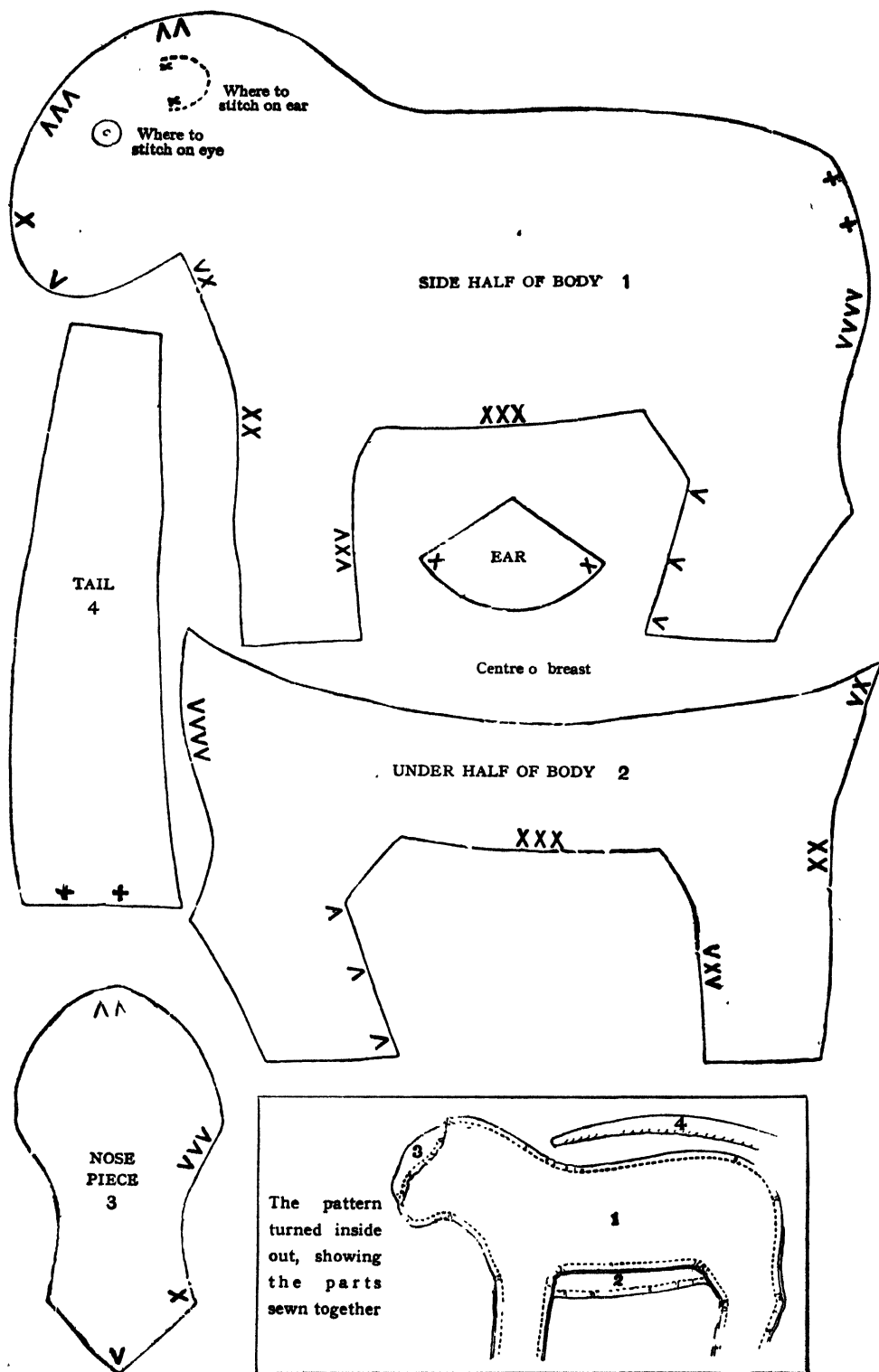
When only the paws are visible, turn in the bottoms and hem down on to the paws. Then take the extra material and sew it tightly together on the inner side of the leg as far up as where the joint should come. From that point it may be left, and filled up with wadding, to show the shape of the thick upper part of the leg.

The tiger has green beads or sequins for eyes, and tufts of white cotton for whiskers. His nose and mouth are made just like those of the lion, and his stripes, copied from a picture, are marked with pen and ink. His ears are just like the cat's, only, of course, much smaller, as the animal is on a much smaller scale. The tail, which is longer than the lion's, has both edges rolled till the two rolls meet in the middle and are sewn together. This is the under side of the tail, of course, and the tip must be tapered to a point.



These patterns can be easily traced on thin paper, which can then be used for cutting out

PATTERNS FOR THE TIGER TO BE TRACED AND CUT OUT



These patterns can be easily traced on thin paper, which can then be used for cutting out

WHAT TO DO WITH A GIRL'S WORK-BASKET

8. THE DOLL'S LITTLE STAYS

LAST time we made the doll's little chemise ; to-day we are going to make the stays, which are made just like a little girl's corsets. A straight band of material, of either twill or coutil, is all that we need. The band should be about 3 or 4 inches deep, according to the size of the doll, and as long as is necessary to go round the body—about 8 or 9 inches.

Fold this piece of material exactly in half to mark the middle of the front, and form a box-pleat about one inch wide. A box-pleat is, of course, made like a very wide tuck which is opened and laid flat in such a way that the stitching comes together in the centre underneath. Tack this down, and then make another tuck half the width of the pleat—an ordinary tuck this time—each side of the box-pleat, and lay them so that they fold outwards. Pictures 1 and 9 explain this quite clearly. When these have been tacked firmly, they should be stitched along each edge with the stitch called back-stitch. This is just ordinary running, except that each time the needle is taken out of the material it is put in again exactly where the last stitch ended, as shown in picture 2. These folds together—the box-pleat and the tuck on either side of it—form the front of the corset and make it firm.

At the back a row of buttons and button-holes are needed to fasten the little stays together—about four will be enough. On each side of the space for the buttons and buttonholes a pleat is made exactly to match those in the front, as picture 9 shows.

The next thing to do is to make the edge neat at the top and bottom. The best way to do this is to bind them by first laying a piece of silk binding, which is like soft tape,

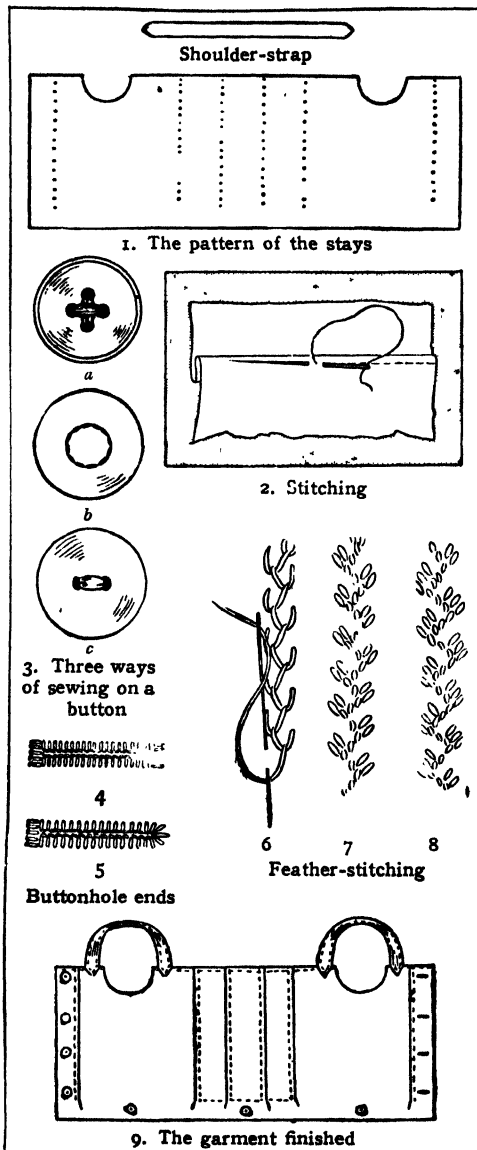
just against the edge on the right side, and running them together. Then turn the binding right over the edge, and hem it neatly on the inside.

The little shoulder-straps are made of a strip of the material folded double and stitched like the tucks, and finished in mitre-point—that is, the little corners are turned inside to form a point.

All that now remains to be done is sewing on the buttons and making the button-holes. Always remember to use buttons a size smaller than the buttonhole, as this prevents it from being stretched and torn. There are many ways of sewing on a button, but the best way, if you have a linen button which is pierced with four holes, is to take the thread through and through to form a cross, as the button marked *a* in picture 3 shows. If you have a button with no holes in it, make a little ring in pencil round the centre of the button, and follow it all round with little back-stitches, putting the needle through at the back and pulling it to the front. This is shown in *b*. The third way of fastening the button, and the strongest, is shown also in the picture [*c*]. This has two holes with very narrow tape run through and fastened at the back. One piece of tape should thread the whole row of buttons.

The fastening off of the thread when the button is secured in its place is an important matter. First of all,

you should never begin to sew on a button by making a knot in the thread, but start by doing two or three small stitches in the material just where you are going to put the button, and then put the needle through both material and button, and back again. Then raise the button a little, bring up the needle and thread between the material and the button, and



◆◆ THINGS TO MAKE AND THINGS TO DO ◆◆◆◆◆◆◆◆◆◆

wind the cotton a few times round the sewn stitches to form what is called a stem. This will protect the stitches and make the sewing firmer; it will also raise the button from the material and make the buttoning much easier. The needle should then be put again through to the wrong side, a few back-stitches done, and the thread cut off.

Making the buttonholes will be quite easy, because we have already learned the stitch on page 490; but what we have not yet learned is how to finish off the ends. There is more than one way of doing this, and it all depends upon where the buttonhole is to be put. If it comes in the middle of a band, it should be finished off at both ends like picture 4, but when it is intended to fasten two edges together, like the back of our little stays, only one side need be made firm by buttonhole stitches across the end, because it is only the side nearer the edge that the button presses against. See picture 5.

When we made the front of the little stays, we finished off the edges of the box-pleat and the tucks by back-stitching them, did we not? But there is another way, and a prettier one, to do this, and that is by feather-stitching them, which holds them just as firm as the back-stitch, and looks much prettier.

When starting to learn how to do feather-stitching, the best way is to trace a straight

line from top to bottom of a piece of canvas, and take up each time the same number of threads on each side all the way down. Thread a crewel-needle with cotton, and bring it up on the line; then hold the cotton under the left-hand thumb, insert the needle at a little distance to the right side, about a quarter of an inch higher than the place where the needle came out, and, pointing it in a slanting direction, bring it up on the line a little below the place it was previously brought out. Pass the point of the needle over the thread held by the thumb, and draw the needle and thread through. Repeat this on the left-hand side.

You will now have a stitch on the right side and one on the left. Now again hold the thread down, and make a slanting stitch on the right side, repeat this on the left side, and go on in this way, making one stitch on the right and one stitch on the left, until you have made the length desired. If this is not clear, look at picture 6, which explains much better than words. The thread must not be drawn too tightly, especially if the work has to be washed, in case the material should shrink.

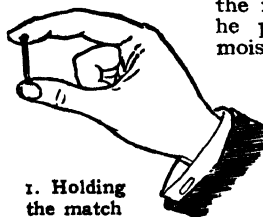
Now, if you want to make fancy feather-stitching, such as shown in pictures 7 and 8, you only have to work two or three stitches, one below the other, on each side of the middle rib, forming double or treble branching.

PULLING ONE MATCH THROUGH ANOTHER

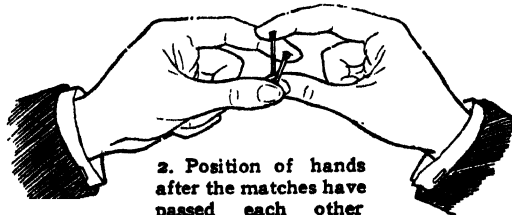
IN this trick the performer takes an ordinary wooden match in each hand, held lengthwise between forefinger and thumb, as in picture 1. He brings his hands together, holding them so that the matches are crosswise to each other. Strange to say, instead of clashing the one against the other when they meet, the one passes right through the other, and the two hands are thereby linked together, each match being now *within* the space enclosed by the match, thumb, and forefinger of the opposite hand. It would seem as though they could not possibly be again separated without dropping one or other of the matches. And yet the performer, by virtue of his magic power, disengages them with the greatest ease, drawing the hands freely apart, quickly or slowly, as may be desired, and re-engages them in like manner, the matches remaining undisturbed between finger and thumb as at first. The trick depends partly upon the kind of match used, and partly upon a little cleverness, which, though by no means difficult, must be practised diligently before the operator ventures to

use it in public. This, by the way, applies to all conjuring tricks. The matches used are those known as phosphorus matches, which we ordinarily use in the house. These are not of the "safety" kind, but have large red heads, into the composition of which a good deal of *glue* enters. The performer prepares for the trick by privately moistening the tip of each forefinger; and, in taking the matches between finger and thumb, he places the "head" end next the moistened forefinger. A little gentle

pressure makes the match adhere to the finger strongly enough to carry its own weight. When he brings the hands together, he does so in such a manner that the match in the left hand comes into contact with that in the right, close to the lower, or non-adhesive, end. A slight relaxation of the pressure of the right forefinger lifts the match in that hand away from the thumb in a very minute degree, and allows the match in the opposite hand to pass through the gap thus created. As soon as it has passed, the thumb closes on the end of the match as before. The matches are separated in like manner.



1. Holding the match



2. Position of hands after the matches have passed each other

A LITTLE GARDEN MONTH BY MONTH

WHAT TO DO IN THE MIDDLE OF MAY

WE have already considered the sowing of annual plants, and even yet—for it is not too late for autumn flowering to make a last sowing, if necessary—French or African marigolds are suitable, as their bright orange and chestnut-colored flowers are always beautiful.

But there are other seeds beside those of annuals that must be thought of this month, and sown at once, if we wish to rear plants that will give us plenty of flowers next year. These plants are either perennial or biennial—that is, they flower once a year or once in two years, and all those mentioned here are quite hardy and able to stand the winter without protection. A true biennial takes much longer than an annual to arrive at the flowering stage, but, having flowered, like the annual, it dies.

A perennial continues to flower year after year. Six packets of inexpensive seeds that may be sown at the present time would include Scotch Pinks, Sweet-williams, Hollyhocks, Canterbury Bells, Everlasting Peas, and Larkspur.

If we have no room in our little plot for them at present, we may still rear them in boxes, pans, or pots. The boxes should not be too large, but they should be deep enough to afford sufficient room for the roots of the little seedlings. Holes must be bored in the bottoms, and over these holes we must place bits of broken pots.

It is a good thing to put some cinder-ashes, as large as nuts, all over the bottom, if sufficient bits of broken pots are not at hand, to a depth of an inch or so, in order to allow the water to escape from the soil. The soil itself should be fine, and, unless already sandy, some silver sand or other fine sand should be added to it.

After the seeds are sown, they should be put in some place that does not catch the midday sun, or, if this cannot be managed, some shade must be given. After a time, when the seedlings are well up, they can be planted out wherever we can find room for them. It need not be the place we wish them to flower in; and in the autumn, if we desire it, they can be moved. They might, perhaps, be planted where a crop of cress has been cut.

Sow thinly and plant out thinly—this must never be forgotten. Although only six kinds have been mentioned, there are hundreds of different kinds that can be reared in this way, or sown in the open ground.

In dealing with the seedling plants, we must remember that when it comes to planting out the stocks we may throw away the largest and strongest ones, and plant only the smaller ones, because the big, sturdy specimens will be the most likely to produce single blossoms instead of the fine double rosette-like flowers we hope for.

Some seasons are a great deal more forward than others, according to the weather; therefore we must be on the look-out to stake

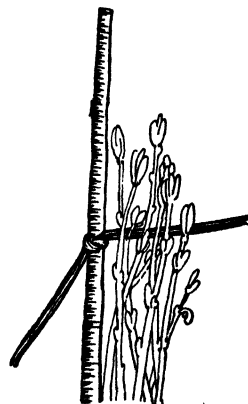
and tie up any plants that show signs of needing it. Once let them grow crooked, or begin to lie along the ground when they should stand upright, and there is little hope of ever tying them up so as to make them look as they should.

This tying and staking is a really important matter, and should be done very carefully. Many people never tie out a plant to the best advantage. Where there are many stems, three or four stakes will be better than one; and some of the stems will be tied to each.

To tie a plant into a tight, thick sheaf is the worst thing possible, both for its appearance and its health. It wants the air to circulate quite freely through it, or it will not produce nearly the number of flowers it might and could do.

For small plants bamboo canes make capital stakes; the stems can be tied out with raffia or, better still, raffia tape. But for tall, heavy plants—that is to say, those that will become tall and heavy before the end of the summer—like the hollyhocks, for instance, strong stakes are necessary, and these must be driven deeply and firmly into the ground. Strong tarred line should be used to tie the plants securely to the stakes, but they must *not* be tied up too tightly or closely.

The stake being driven down, the tying material should first of all be tied to the stake, and then brought forward round the stems of the plant, as by this method there is no fear of the line slipping down. The illustration on this page makes this quite clear. The first tying will have to be followed by a second later on, when the plant shall have made further growth, especially in the case of tall ones.



How plants are tied up to help them to grow straight

We must remember that we are not tying up our plants solely for fine, still days, but to help them to withstand sudden storms and high winds. Many of them would never need tying at all if the weather were always fine and sunny, but these are often the ones that need it most when rough winds buffet them and heavy rain beats them down.

If a sowing of radishes has not yet been made, the seed may be put in at any time. It is best to sow a few seeds at a time, and make three or four sowings, so that they may all be eaten at their best. Radishes should be carefully attended to and watered every day if necessary, as the best and crispest radishes are those that are grown quickly.

THE MAGIC OF A GLASS OF WATER

FOR every mystery there is an explanation.

We are sometimes a very long time finding the explanation, but the more we know about the true meaning and the properties of things the more mysteries we are able to explain; and as soon as we can explain a mystery, it ceases to be one.

Look at your face in a mirror. Why does the mirror show everything in front of it? Because it has the property of *reflection*. Throw this book into the air and see what happens. It falls downwards. Why not upwards? Why not sideways? It falls downwards because of what we call *gravitation*.

Now we will try a curious experiment, which you will understand if you understand what gravitation is. All you need

are two tumblers, or cups, a little water, and a short piece of indiarubber tubing. Any sort of tubing will do, but it should be small and thin like the tubing of the old-fashioned feeding-bottle. Put a tumbler of water on a box or some books on a table—on anything that will cause it to stand a few inches higher than it would stand if you were to put it on the table.

Now put an empty tumbler on the table near the high tumbler. The tumbler holding water will now be higher than the empty tumbler. Put the end of the rubber tubing into the glass with water. Let it go down in the water. Now put the other end of the tubing into your mouth, and suck some of the water up. When the tubing is full of water, squeeze the end of the tube which you have in your mouth. Take it between your finger and thumb, holding it tightly, and put this end into or over the empty tumbler, still keeping the other end of the tubing below the surface of the water in the high tumbler. The part of the tubing dangling over the side of the full tumbler should be longer than the part inside the full tumbler.

Now if you take away your fingers, thereby letting the lower end of the tubing open, the water will begin to flow, and will continue to flow until the high tumbler is empty, or until the water in the high tumbler is below the end of the tubing up which the water has been flowing.

You have made what is called a *syphon*—not the kind that holds soda water, for this is not a true syphon, but what men of science and engineers call a syphon.

Can you explain what has happened? Suppose you take a string, tying to one end a large stone or weight and to the other end a small stone or weight, and suppose that you put the middle of the string over a wheel or a smooth rail. You know what will happen: the heavy stone or weight will fall and pull up the little weight until it follows it down the other side of the wheel or rail.

The water in the long leg of the tube is like the heavy weight, and the water in the short one is like the small weight. But you say that the two weights would be tied together, while water is not tied to water. That is true; but unless air gets into the tube of your syphon the effect is just as if the heavy column of the water were tied to the light column of water. Perhaps it would make

it clearer if I were to say that the heavy column of water falls down and *sucks* up the lighter column. The light column of water then becomes the heavy column, and sucks up more water, and so on until all the water possible has been sucked up and flowed down the tube.

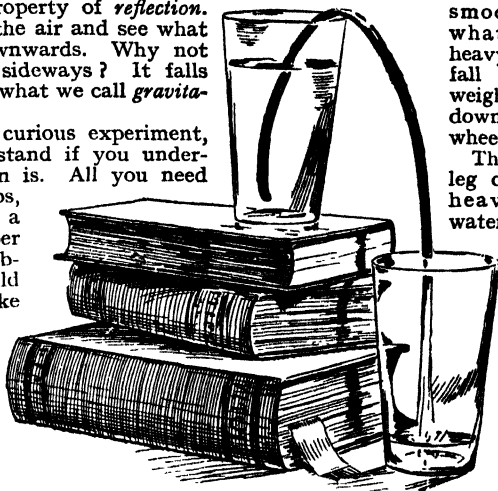
We shall try another experiment—how to make a penny rise up in water. It will not really rise up, but it will seem to do so, and the experiment is a very curious one. It shows that we do not see through water quite in the same way as we see through air.

Put a saucer on a table or on a sideboard, and put a penny in the middle of it. It will then look as shown in picture 2.

Now get someone to look at it. Ask him to sit a little lower until the penny is just hidden by the rim of the saucer. He will then see the saucer, but not the

penny. It will be like picture 3.

Now, while your friend sits still, pour water into the saucer. Do it very steadily so as not to spill the water. The penny will come into sight. It does not really rise. It is the water that makes it seem to



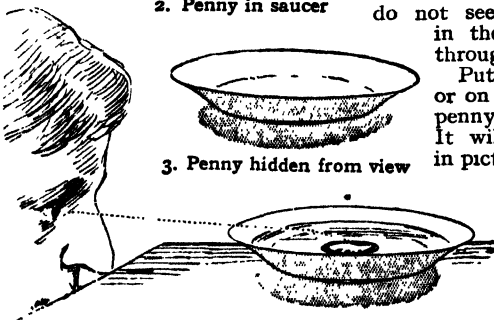
1. A simple syphon showing how water flows upwards



2. Penny in saucer



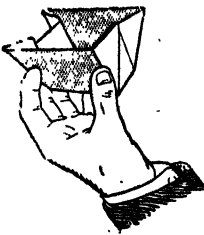
3. Penny hidden from view



4. How we see through air and water

THINGS TO MAKE AND THINGS TO DO

do so. This is because, when you look through air, you see in a straight line. When you look through air and water you see along two lines,

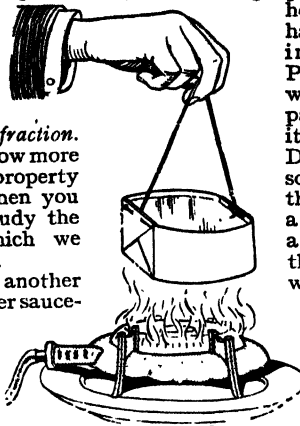


5. Making the box

as shown in picture 4.

This curious property of water is called *refraction*. You will know more about this property of water when you begin to study the subject which we call *physics*.

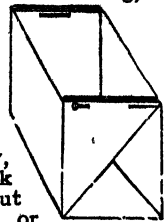
Another experiment shows yet another curious thing. To talk about a paper saucepan seems absurd, but it is not so ridiculous as it sounds. We can really make water boil in a paper saucepan without much difficulty. First, we must make the saucepan. Take a piece of paper—ordinary writing paper will do. Fold it over something of square or oblong shape, as seen in picture 5. Put a pin through the folds at the sides, as seen in picture 6, to make the box



7. Boiling water in the box

keep its shape. Now put a thin piece of string around the parts of the two pins inside the box, and hang up the paper box to something, or

hold it in your hand, as shown in picture 7. Pour some water into the paper box until it is almost full. Do it very gently, so as not to break the paper box. Put a lamp, a candle, or a gas flame under the box. The paper



6. The box finished

will not burn, as we might expect, but the water will get hotter and hotter until it boils. This result, which seems strange, is caused by the water, which will not allow the paper to retain the heat, but draws it to itself. This effect is due to what is called *radiation*. Instead of getting hotter and hotter until it burns, the paper gives its heat to the water, which gets hotter and hotter.

THE BALL THAT ANSWERS QUESTIONS

ONE of the most interesting toys is a ball that seems to count and answer questions. To people who do not know the secret of its manufacture it is very mysterious; and any boy can derive much amusement by making one, and showing it to his friends after he has practised with it a few times and become expert in its use.

First, we get a wooden ball, of any size we like, but not too tiny. A croquet-ball will do nicely, or one about the size of a golf-ball; but, whatever size it may be, it had better be of wood.

The first thing to do is to mark upon the outside of the ball two points, exactly opposite each other. In most wooden balls we find two centre-points, that the wood-turner has used when making the ball. Then we use a gimlet, and make a hole in the ball, but *not* in a straight line towards the other point. The first illustration (1) shows how the hole is made; it is not through the centre of the ball, but to one side. The hole is not made to go right through the ball, but it must go more than half-way.

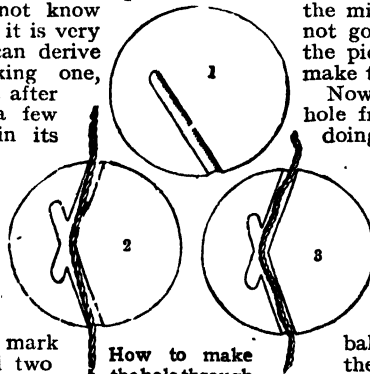
Now we bore another hole from the opposite point. This is the only difficult part, for the second hole must be made so that it goes right into the first hole, and the result is that we have a continuous hole right through the ball, but not in a straight line. The next two

pictures (2 and 3) show how the hole would look if we were to cut the ball right through the middle. But, of course, we are not going to cut the ball through; the pictures are only to help us to make the hole properly.

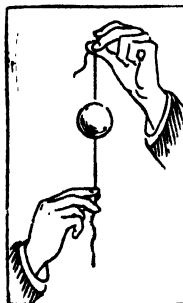
Now we put a string through the hole from side to side, and after doing so we had better put something—say, a button—on each end of the string, to prevent it from slipping out of the hole. Now, if we hold up the ball as the boy in the fourth picture is doing, pulling the string tightly as we do so, we find that the ball remains fast at any part of the string we like. Let the string loose just a little, and the ball begins to slip down. Again pull it tight, and again the ball rests.

Now we can ask the ball questions. Hold the string tightly, with the ball at top of it. "Ball, how many do two and three make?" we ask; and, for reply, the ball takes five short steps down the string. Of course, we are making it do so, by making it tight and loose as we wish. Then we say: "Ball, I am going to ask you some questions. If you mean yes, move once; if you mean no, move twice." We can ask any questions we like, and the ball can always answer them if we are allowed to hold it up by the string.

A little practice will enable us to move the ball without anyone detecting how we do it.



How to make the hole through the magic ball



4. Holding the ball

MORE GAMES TO PLAY OUT OF DOORS

HERE are some more games for boys and girls to play out of doors. Some can be played on the lawn; others are more suited to the playground.

TUG OF WAR

A STRONG, long rope is laid on the ground across a chalk line. The players are then divided into two parties, one side taking up the rope on one side of the line and the other the opposite side. At a given signal they pull against each other with might and main, and the side that draws the enemy over the line are the victors.

LEAP-FROG

THE frog bends down with his hands on his knees and his back up. The leaper runs toward him, places both hands on the bent back, and, spreading out his legs, passes over, to come down on his feet the other side. Running a short distance, he bends in turn, and he who has lately been frog goes over him in the same way. If a number of boys be playing it becomes great fun, for as each one goes over he runs and bends, so that there are many backs to leap before a turn comes to stoop.

A SACK RACE

IN this race each runner puts his feet into a large sack, and draws the top of it together round his body, where it is tied with string. Before beginning to run it is best to push your feet well into the opposite corners of the sack, so as to have as long a step as possible, and not to try to go too fast. If you go fast you may fall, and it is not at all easy to get on your feet again once you are down.

FIELD GOLF

WE are going to play golf in a new way, which is quite simple, but very good fun. Choose a starting-point in a large field and dig there a very small hole. One hundred steps away, in a straight line from this, we make another hole in the ground. Then, at the end of another hundred steps, another hole, and so on until we have gone round the field and are back at the starting-point. These holes mark our golf-course. Each player is armed with a club-ended stick and a small, hard indiarubber ball. The game is to strike these balls round the course, knocking them into each hole as it is reached, and the one who does this and gets round to the starting-point with the fewest strokes wins. Each player, of course, only hits his own ball. The starting-place should also be used as the last hole.

TIP-CAT

THE tip-cat is a short piece of wood, sharpened like a lead pencil at both ends. It is placed on the ground in the middle of a large circle, and the first player strikes one end sharply with a stick. As it leaps into the air he strikes again, and if he succeeds in driving it to a distance he follows

it up and continues to "tip" it till he misses, when the next player carries it back to the circle and takes his turn. The one who makes the most "tips" without a miss wins the score.

TOM TIDDLER'S GROUND

TOM TIDDLER'S GROUND is marked off with a chalk line, and should be nearly half the playground. The boy chosen for Tom Tiddler takes his stand on it to protect his gold and silver, and he must never cross the chalk line. Presently some of the other players rush over the boundary, crying, "I'm on Tom Tiddler's Ground, picking up gold and silver." Any boy that Tom can touch before he escapes should be made to hand over a forfeit, or stay as a prisoner. On the other hand, if Tom chases him beyond the line, and another player enters the ground before Tom gets back, the new-comer may take his place, and becomes Tom Tiddler.

STEEPLECHASE

THIS is hard work as well as good play. Before starting, a certain point is fixed upon at some distance, with fences and ditches and hedges and brooks in between. Then the word "Off!" is given, and the players race away to see who can get there first. In such a race it is not certain that the fastest runner will win, for the boy who knows how to get over a difficulty stands a good chance.

THE TRAVELER AND THE WOLVES

THE smallest boy or the slowest runner is the traveler, and the traveler has to get to his journey's end without being caught. The rest of the players are the wolves. Before setting out on his journey, the traveler is given as many tennis-balls as there are wolves, and, of course, there should not be more than four or five, or he will have too much to carry.

When he has got some distance away, the wolves roar out that they are coming, and the race begins. When the traveler finds a wolf overtaking him, he throws out one of the balls, which the wolf must secure before he can take up the race again. Of course, the traveler's object should be to throw the ball in a way that will lead the wolf from the direct path. Thus, he should never throw it in front, or the swifter runner will pass him to secure it, and then merely wait for him to come up. Knowing what the traveler is going to do, the wolves will probably spread out a little to either side in the hope of stopping the balls more quickly. Therefore, the traveler should do his best to find out where the nearest wolf is, and the more skill he shows in managing the balls the greater will be his chance of escape. Above all, he should not throw them away too soon.

If the chances against him are very great at the start, he might be provided with more balls than there are wolves. Of course, a distant spot should be chosen as a goal.

LITTLE PROBLEMS FOR CLEVER PEOPLE

THESE problems are continued from page 624, and the answers below refer to the problems on that page.

WAS IT QUICKER TO CYCLE?

36. James and John are cycling from Springfield to a village 20 miles distant, and when they have gone only 4 miles John's machine breaks down. They wish to reach their destination at the same time. They can both walk or they can use the cycle alternately. They can walk 4 miles an hour and cycle 8 miles an hour. Which is the quicker way?

WHICH ROAD DID CHARLIE TAKE?

37. Charlie started from his home intending to cycle to a village 10 miles away. He came to cross-roads and found that the signpost had been pulled up and lay in the middle of the road. Yet he made the signpost tell him which was the proper way to go. How did he do it?



How did Charlie know the way?

HOW LONG WERE THE CANDLES?

38. I had two candles, one of them an inch longer than the other. I lit the longer at 4.30 and the shorter at 6. At 8.30 they were both the same length. The first burnt out at 10.30 and the second at 10 o'clock.

How long were they before I lit them?

WHEN WILL HARRY HAVE A CYCLE?

39. Harry, aged 12, has been promised a bicycle when he is one-third the age of his father, who is now 56 years old.

When will Harry get the bicycle?

HOW LONG WAS THE TELEGRAM?

40. A man sent a telegram from New York to Albany. If he had sent it to London it would have cost him 25c. a word, and the total cost would have been \$1.25 more than he paid. How long was the telegram?

HOW MUCH WATER WAS SPILT?

41. A boat leaving a wreck had water to last 13 days, allowing each man one quart each day. After 5 days some water was spilt, and one man died on the same day. The water then lasted just the expected time. How much water was spilt?

HOW MANY TRAINS?

42. A train leaves New York for San Francisco every morning at 9 o'clock, and another leaves San Francisco for New York every morning also at 9 o'clock. Each train takes exactly five days to make the journey across the continent.

If I travel in one of these trains, how many trains shall I

pass coming in the opposite direction?

WHICH FARM WAS THE BIGGER?

43. A farmer in Canada boasted that he had a farm of 4 square miles. Another farmer, who heard him, said: "My farm is bigger than yours. It is 3 miles square." Was the second farm really the bigger?

WHICH IS THE HEAVIER?

44. "Which is the heavier," asked Herbert, "an ounce of gold or an ounce of feathers?" "An ounce of gold, of course," replied his sister Maud. "But a pound of feathers is heavier than a pound of gold," said Herbert.

Was he right?

THE ANSWERS TO THE PROBLEMS ON PAGE 624

30. The train passed me—that is, traveled its own length—in 9 seconds, and it traveled its own length and 88 yards in 21 seconds. Therefore, it went 88 yards in 12 seconds, and, seeing that it traveled its own length in 9 seconds, its length is three-quarters of 88 yards—that is, 66 yards.

31. In another 3 years Tommy will be 6 years older than he was 3 years ago. If his age is then 3 times what it was 3 years ago, 6 years must be twice his age 3 years ago, so that he was 3 years old 3 years ago, and he is 6 years old now.

32. With no current Duncan would go three-quarters of a mile in one quarter of an hour—that is, 3 miles an hour; but he actually goes only at the rate of $1\frac{1}{2}$ miles per hour, and the difference between 3 miles and $1\frac{1}{2}$ miles is the speed of the current, which is, therefore, $1\frac{1}{2}$ miles an hour.

33. Ten miles an hour is 1 mile in 6 minutes,

so that if the farmer had gone home by the road he took on the outward journey he would have saved 24 minutes instead of 12 minutes. Eight miles an hour is a mile in $7\frac{1}{2}$ minutes, and at 10 miles an hour he therefore saves $1\frac{1}{2}$ minutes in each mile. As the saving in time would have been 24 minutes (which is 16 times $1\frac{1}{2}$ minutes) by the shorter route, it must have been 16 miles. Thus the outward journey was 16 miles long, and the homeward journey was 18 miles.

34. The whole sum was in 4s. pieces.

35. When the first party of men met the second party they had used one day's food, and the remainder would have lasted them 4 days more, but as the addition to the party curtailed the period by one day, the new men must have eaten as much in 3 days as the 9 men ate in one day. But 3 men would eat as much in 3 days as 9 men eat in 1 day. Hence there were 3 men in the second party.

THE NEXT THINGS TO MAKE AND DO BEGIN ON PAGE 843.

The Book of SCHOOL LESSONS

WHAT OUR LESSONS TEACH US

IN this section of our Book of School Lessons, we shall learn more of the little words of three letters, and the figures which stand for the numbers from zero to nine. Another primary reading lesson is given, each one being a little more difficult than the last. In the Music Lesson we read about the road that the fairies travel on. Tom and Nora learn to write more letters, and our drawing lessons have advanced so far that we are now ready to draw and paint leaves and twigs, and even blossoms. We shall then enjoy many a spare moment with our paints.

CONTINUED FROM PAGE 463

WORD-BUILDING

HOW TO LEARN LITTLE WORDS

CAN we say now that we know our A B C, do you think? We must try to learn it perfectly, so as to be able to know any letter whenever we see it. In our last lesson we learnt a few words of two letters each, and a few more of three letters each. Perhaps, before we go on to words of four letters, we had better be sure about the three-letter words. Here are a few more of them.

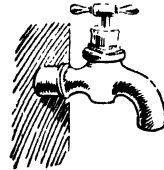
A P spells AP, which is not a word at all; but if we put a C, or an M, or a T in front of it in turn, we get real words.



CAP



MAP



TAP

E N spells EN, and if we put first a D, or an H, or an M in front, we get DEN, HEN and MEN.



DEN

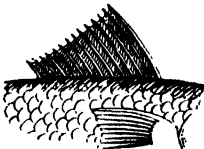


HEN

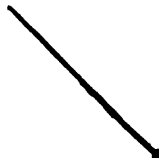


MEN

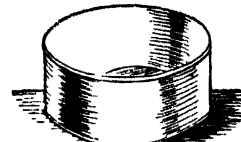
I N spells IN; put an F, or a P, or a T in front, and what do you find? Why, FIN, PIN and TIN.



FIN



PIN



TIN

Once more. **U G** spells UG, and with an M, or a P, or an R in front, we have these very different words — MUG, PUG and RUG.



MUG



PUG



RUG

Or perhaps you can
learn words better in this
way :

When boys and girls are
fast asleep,
And beasts go out to
prowl,
If you're awake, you'll
often hear
The hooting of an
OWL.

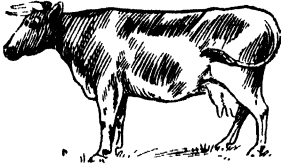


OWL

If father would give
me a penny,
I would soon be inside
of this shop :
It's the jolliest window
of any,
And oh, how I *should*
like that 'TOP' !



TOP



COW

This is how
We draw a COW.



BOY—TOY

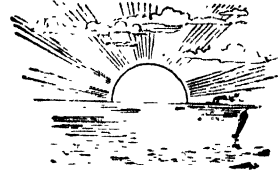
If you want to give joy
To a poor little BOY,
Just give him a TOY.

You have many ;
Although you have a lot,
There are boys who have
not :

In, fact, there are some
without any.

Two and two are four.

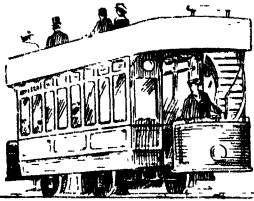
$$\begin{array}{r} 2 \\ 2 \\ \hline 4 \end{array}$$



SUN

What is it makes the day-
light when
The night is past and
done ?

We know it is the S U N,
And S U N spells Sun.



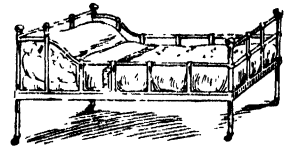
CAR

If you live in a town,
And you want to go down
To see where the toy-
shops are ;

If you take my advice,
You won't stop to think
twice,
But will jump on the very
first CAR.

When you begin to add
and count,
And to arithmetic you
come ;

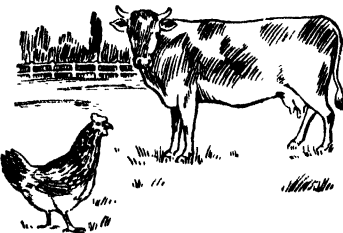
The first thing you will
have to learn,
Will be to do this little
SUM.



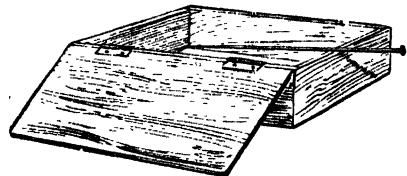
BED

" Oh, mother, just a
minute more ! "

Poor Willie always said
Whenever night - time
came, and he
Was ordered off to
BED.



A HEN AND A COW
ARE IN THE FIELD



THE PIN IS TOO
LONG FOR THE BOX

PRIMARY READING LESSON

Hark, hark,
 The dogs do bark,
 Beggars are coming to
 town;
 Some in rags,
 Some in jags,
 And some in velvet
 gown.

Hark! Hark! Hark!
 Bow-wow-wow!
 Hear the dogs!
 Bow-wow-wow!
 Bow-wow.

Do you see the beg-
 gars?
 Are you afraid?
 Are the dogs afraid?
 Will the beggars run
 away?

See the beggars!
 Bark, dogs!
 They are coming to
 town.
 Bark at the beggars.
 Bow-wow-wow!

Oh, no,
 They are coming to
 town.
 Some are coming in rags,
 Some are coming in jags,
 Some are coming in vel-
 vet gown.

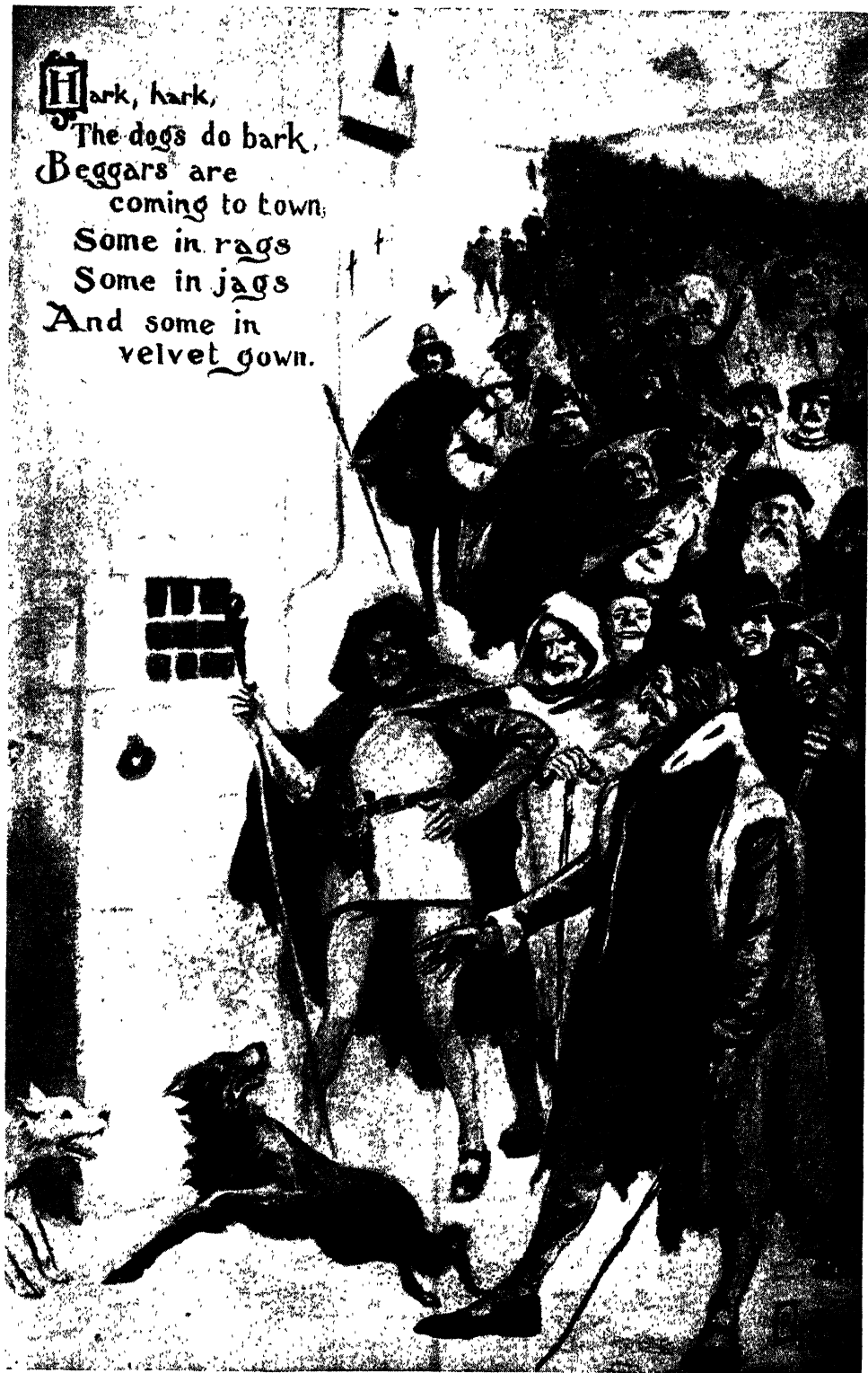
ACTION SENTENCES

Play you are a beggar in rags or in jags or in velvet gown. Play you hear a dog bark.

Play you come to town. What will you do?

THE BEGGARS ARE COMING TO TOWN

Hark, hark,
The dogs do bark,
Beggars are
coming to town,
Some in rags
Some in jags
And some in
velvet gown.



TOM AND NORA MAKE MORE LETTERS

"TO-DAY we are going to write something you know quite well," said the children's mother, as they watched her rule lines for them. "Nora, bring me your straw hat--the sailor one."

When Nora brought it she found that Tom had fetched a little dish from the kitchen. Both were put on the table before them, and their mother asked in what way they were alike.

Tom looked a moment, and then said :

"Well, mother, one is china and the other straw. The only way they are alike is in their roundness."

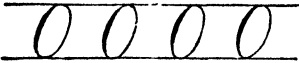
"Yes, Tom," said his mother ; "but are they really round like a ball, or a hoop, or that marble in your pocket ?"

Tom put the marble on the table, and both he and Nora exclaimed :

"The marble is rounder."

Their mother told them the marble was round, the dish and the hat were *oval*, and that they were going to make a letter like the dish and the hat.

"The letter is o," she said, "and I want you to make it oval, not round, and to start on the right of the curve at the top, like this :



"Notice how my pencil presses heavily on the down curve and lightly on the up curve."

After watching their mother, Tom and Nora took their pencils and wrote a line of o's.

"O's seem easy to make," said Nora, looking at her row, "but it is not easy to make them all alike."

Tom was finding this out too. Some of his o's jostled against one another. Some looked as though they had quarreled and would not make friends. But the next rows Nora and Tom made were much better, and their mother said that after a little practice they would write them well.

"What is the third letter of the alphabet, Tom ?" their mother asked.

"C," said Tom promptly.

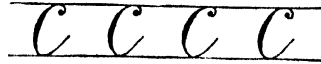
Their mother said that now they knew how to make o, there would be no trouble about c.

"Look," she said, "c is very much like o in shape, but I begin with a

dot, curve up and round to the left, then down, round, and down to the right, and then, instead of taking the pencil up to meet the dot I started with, I pass it up and out to the right."

"Yes," said Nora, "I see, and you make the curve at the bottom of the line bigger than that at the top."

This is how the c's were made :



While Tom was writing his row of c's, he said it seemed to him as though the two ends had joined once, but the join had snapped, and the upper part had sprung back and coiled into a dot.

"Like the spring father showed me in his watch," he added.

"C stands for cousin," their mother said. "C-o-u-s-i-n. Why, you can make all the letters in cousin except s. The next letter to make is the first in the alphabet, and you can nearly make it already. Let us see what it is like."

As their mother wrote rows of a's for Tom and Nora, they watched her closely, and before she had made many Nora exclaimed :

"Why, mother, you are making o !"

"Yes," she replied, "and what else ?"

"A pot-hanger," exclaimed Tom.

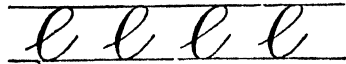
"So it is," said Nora, "and the two are joined up close together."

Their mother showed them how, after making the o, she kept the pencil on the paper, and made the pot-hanger down the side of the o without lifting the pencil, like this :



"There is one other sister-letter to o, c, and a yet to make, something like c ; it is e."

Then they were shown how e, instead of beginning with a dot, made a loop, starting outside and below the middle of the curve on the left, like this :












Tom said that e was like c, with the curled-up dot pulled out and put round behind its back.

"Next time," said his mother, "we will make r, v, w, x, and s."

0 1 2 3 4 5 6 7 8 9

TO-DAY we are going to learn the figures which stand for the numbers. We will count how many children there are in each line ; then, at the end of every line, we will write the *name* of the number, and after that the *figure* which we can use instead of the name.

	One	..	1
	Two	..	2
	Three	..	3
	Four	..	4
	Five	..	5
	Six	..	6
	Seven	..	7
	Eight	..	8
	Nine	..	9

When there are no children at all, the number is called *nought*, and the figure which stands for it is 0.

You know we have learned to count as far as *twelve*, and we shall soon go on to much bigger numbers than that. But you must not be afraid that we shall have to learn a new figure for every new number. We should never manage to do that.

As we go on we shall find that those ten figures, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, will be all we shall need. We shall see that the 1 and the 0, written close together like this, 10, stand for *ten*, and that 11 stands for *eleven*, and 12 for *twelve*. But it will perhaps take us a little time to understand *why* the figures are written that way for ten, eleven, and twelve.

Before we talk any more about that, let us do a little more counting, and use figures for writing down the answers, instead of having to spell the names of the different numbers.

Two keys and three keys make how many keys altogether ?



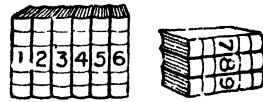
2 and 3 make how many ? 5.

Tom had four pennies, and his father gave him two more ; how many had he then ?



4 and 2 make how many ?

There are nine books on a book-shelf, and we take three of them away ; how many will be left ?



3 taken from 9 leave how many ?

If I take away another three of the books, how many will be left then ?

3 taken from 6 leave how many ?

How many threes, then, make nine ?

Seven jugs were standing on the table ; if three get knocked over, how many are left standing ?



3 taken from 7 leave how many ?

How many more jugs must be knocked over to make seven altogether ?

How many added to 3 will make 7 ?

A boy has seven marbles ; how many more must he win to make eleven altogether ?



How many added to 7 will make 11 ?

John had ten apples, and gave five away ; how many had he left ?



5 taken from 10 leave how many ?

So, how many fives make ten ?

Next time we shall begin to learn something about the numbers bigger than twelve. We can learn much by counting the cards which we use for playing "Snap," or any other game of that sort. Or, if we have not any cards, we can count pencils or marbles.

THE ROADS THE FAIRIES TRAVEL ON

IN the days of long ago the fairies had much to sing about—beautiful stories for the men and women, boys and girls, who live in this bright, happy world.

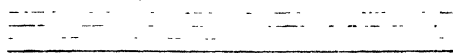
When a fairy has told someone of her beautiful secrets, she likes them to be told again and again, because the fairies like us to make one another happy, and if they told you and me a lovely story, they would expect us to take that story to someone else.

Now, it is one thing to hear a tale, and quite another thing to be able to tell other people about it. First of all, we are living in quite a big world, which contains many countries, and each country has a great many people in it, speaking different languages, and it would be quite impossible for a little boy or girl, or even for a grown-up person, to whisper the fairies' secret in everyone's ear. Happily for us, long, long years ago a great discovery was made—the Fairies' Map was found, and everybody set to work to understand it. That is what you and I are going to do, because we want to know all the beautiful stories the fairies have told, as well as the many new tales they may have in store for us.


We will begin by taking another look at our magic kingdom—the piano, and we will go at once to Fairy C's house, which is in the middle of the long black and white line. We shall find she is at home, waiting for us, because she has something very important to tell. She says that this house of hers is the meeting-point of two roads. That part of the black and white line on her left-hand side is called *the Bass Road*, and the part of the black and white line on her right-hand side bears the name *Treble Road*. We must try to remember these names, because when we want to know what the fairies have


said, they let us know which of these two roads we are to find, and which house in that particular road we are to visit.

First, they draw five straight lines, just like this:



These are the fairy motor-lines for the fairy motor-cars, and both fairies and goblins have a very special name for them. They call them a *staff*, and each road has its own staff. The fairies know we might easily lose our way, so as they are kind little people they have sent us two small guides—one is a little fairy girl and the other a little fairy boy. The fairy girl is Fairy G's godchild, and the fairy boy has Fairy F for a god-mother. Fairy G's little goddaughter carries a banner of curious design, just

like this:  and Fairy F has given

her godson a banner with this strange device: 

Directly the little guides are called, they come and take up their position at the entrance of their own "staff," so that they may show us the way. Fairy G calls her little helper *Treble Clef*, and she has to stand at the entrance of the road which bears her name. Look at the picture above.

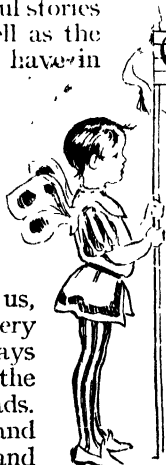
Fairy F's little helper is called *Bass Clef*, and he is on duty in the road which is named after him. There is a picture of him on this page.

To-day we just want to amuse ourselves with the fairy motor-lines, and I think we shall like drawing them.

We must also remember the two roads in our fairy kingdom. First, the road running to the right of Fairy C's central house, called *the Treble*, because little "Treble Clef" stands at the entrance to guide us. Second, the road which lies to the left of Fairy C's central house, and is called *the Bass*, because little "Bass Clef" is waiting at the entrance. Next time we will find out where each fairy stops her motor-car.



The Fairies' Treble Road.



The Fairies' Bass Road.

PICTURES OF LEAVES AND TWIGS

HAVE you ever noticed that the trees begin to alter and look spring-like in the early days of the year, long before the green leaves come? Every little twig bears a bud that grows bigger every day, and the twigs and buds on each kind of tree are quite different from one another. We should be able to draw these twigs and buds so well that people will see at once whether we are drawing an oak twig, or a chestnut twig, or whatever twig we have chosen.

Can you get some from different trees to-day and try? If you cannot manage to find any twigs, perhaps you can get some flowers and leaves, snowdrops and ivy leaves. We will learn how to draw each of these things, beginning with the twigs.

Have your paint-box and brushes ready, quite clean, and a jar of clean water. Pin a sheet of brown paper on your board, and have a sheet of white paper near, as you will want it afterwards. We shall want black and white chalk, and two pencils, one with a fine point and one sharpened flat, like the edge of a chisel.

If you do not know the name of the tree from which you have taken your twig, ask someone

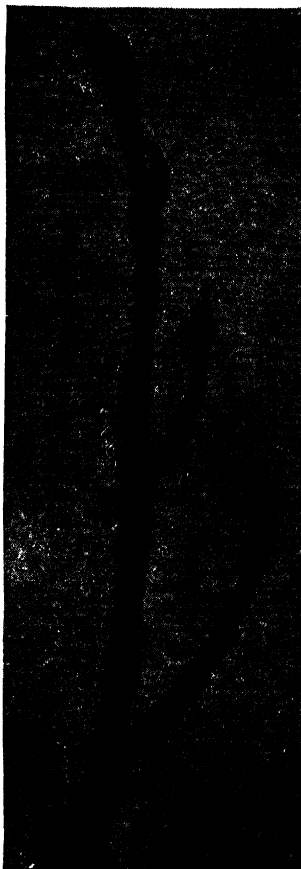
to tell you. Now put the twig beside you on the table, on the *left-hand* side of your board, and if you can sit with the light coming from a window on the left-hand side too, it will be much better for you than having the light come from the front or from the right-hand side.

Take a good look at the twig; notice how it curves or turns, first to one side, then to the other. Take your black chalk and draw the longest piece first. It is thickest at the end where it was broken off from the tree. Draw the twigs branching from it next—if there are any—and then the buds.

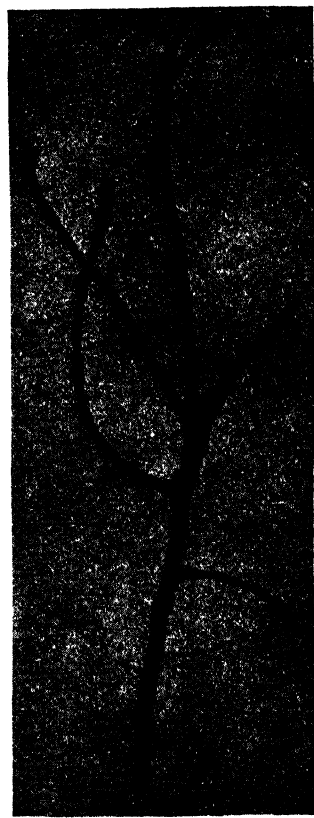
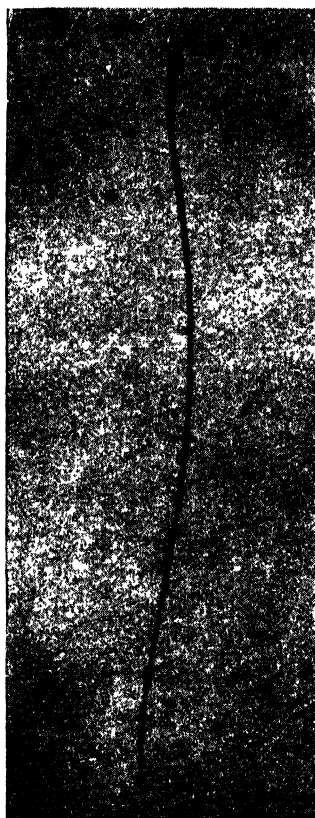
One thing is very important, and we must show it on our drawing. It is this: the stem grows thicker wherever

a smaller branch or bud starts from it. This is because the food on which the buds feed all the winter is stored there. Without that little storehouse they could not grow, so be careful to thicken your twigs in the proper places.

If you find it very difficult to get all the little branches right at first, you may put the twig on the paper, and mark, with a little dot, the place where each one comes. But we should not do this often, as it is rather a baby way. I hope the



Look closely at a twig of a tree. Notice how the stem grows thicker wherever a branch starts from it, and show this in the drawing by thickening the line.



If you find it difficult to get the branches in the right places, put little marks where they begin and end, before you start to draw.

drawing is large enough. and see by putting the twig you have copied on the top of your drawing. Do it again if it is too small, for it is a very bad fault to draw things too small. Now get the white paper, and mix some colors to match the shade of the stem ; the buds will want a different color.

If the stem is grey, mix together light red, cobalt blue, and yellow ochre. A bluish grey will want most blue paint ; a greenish grey will only want a little red. Do not put out too much color if you have tube paints, as you will only want a little.

If the stem is brown, use sepia or Vandyke brown. Try your paints carefully till you get the exact shade, and after you have painted the stalk

Draw the branches, beginning at the stem and ending at the point where the bud is. Now we are ready for our white paper and paints.

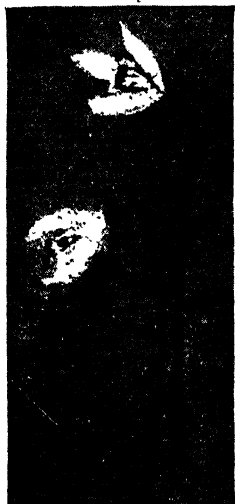
Measure it you must get the exact color of the buds

Paint the twig at once this time, without any outline. Make the stem brown, then paint the buds. Remember to paint downwards.

and put them in.

Paint straight away with the brush, holding it rather upright, but do not make a pencil outline first. Always paint downwards, not upwards. If you have snowdrops instead of twigs, use white chalk on brown paper for the flowers and black chalk for the stalks. If you have leaves, put the shapes in in black chalk, without making an outline first.

The snowdrops must be painted with Chinese white on brown paper. Paint flower and stalk in white first ; then, when the paint is dry, paint the stalk green, over the white. Lemon yellow and cobalt blue, with a very little light red, make a good green. The ivy leaf must be painted in green



In drawing snowdrops use white chalk for the flowers and black for the stalks. Paint the flower and stalk in Chinese white, and then paint the stalk green.

THE BOOK OF SCHOOL LESSONS



Paint the ivy leaf on white paper with green paint. Make the paper damp and paint downwards, putting on the color quite flat and smooth.

on white paper. No outline must be made first. Ivy leaves are sometimes dark green and sometimes bright green.

Use Prussian blue, gamboge, and a little light red for bright green. Put Vandyke brown with the blue and gamboge, instead of red, for dark green. Let the paper be damp—not too wet—see that it slants a little, and paint downwards. Do not try to shade the leaves; put the color on quite flat and smooth.

When you have done this, you can, if you like, practise your pencil work by drawing a cobweb like the one you see in the picture. If you have drawn twigs, you can make it hang from them; but if you have drawn *flowers or

leaves, draw it separately in the corner of the paper, the long lines first meeting in a dot in the centre, and then the little short lines going round. Use the chisel-pointed pencil for the long lines and the other pencil for the short ones.

Remember that it is better to take another sheet of paper and make a fresh drawing if you do not like your work the first time you do it. If you use indiarubber the paper soon gets worn away, and the pencil lines never look well afterwards. Very often, too, the drawing looks dirty where the indiarubber has been used. So try to get the lines right the first time, and if you cannot manage this, try again, making a new line altogether. It is a very bad plan to think it doesn't matter to draw a line carelessly because it is so easy to rub it out. This is really a waste of time. Next time we are going to learn how to draw straight lines, and later on, how to measure things from a distance, and how to draw and paint flowers.



Here is a cobweb between two twigs Draw these in in pencil.

LITTLE PICTURE-STORIES IN FRENCH

This story is continued from page 463. This part tells us of the arrival of the party at Dover. We must be sure to remember that the first line under the picture is the French, the second gives the English word for the French word above it, and the third line shows how we make up the words into our own language.

Enfin nous sommes en route.
At last we are on way.
At last we are on the way.



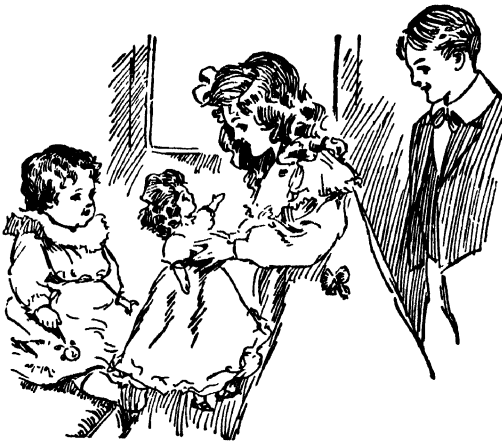
Papa et maman lisent les journaux.
Papa and mamma read the papers.
Papa and mamma are reading the papers.

Bébé pleure et fait le méchant.
Baby cries and makes the naughty.
Baby cries and is naughty.



Il veut être le papa.
He wants to be the papa.
He wants to be papa.

Je lui dis qu'il est trop petit.
I to him tell that he is too little.
I tell him that he is too little.



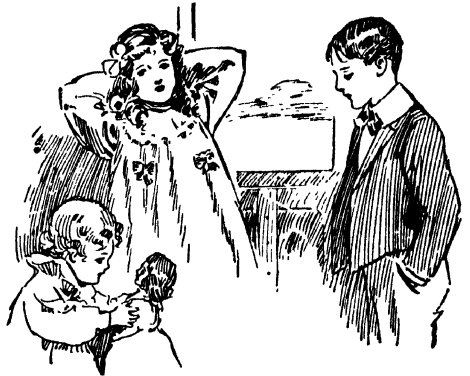
Nous jouons à la poupée.
We play at the doll.
We play with the doll.

Je suis le papa. Jeannette est la maman.
I am the papa. Jenny is the mamma.
I am papa. Jenny is mamma.

Bébé et la poupée sont nos enfants.
Baby and the doll are our children.
Baby and the doll are our children.

Nous les aimons beaucoup.
We them love very much.
We love them very much.

Jeannette le console.
Jenny him comforts.
Jenny comforts him.



Nous sommes fatigués de jouer.
We are tired of to play.
We are tired of playing.

Bébé dit qu'il a faim.
Baby says that he has hunger.
Baby says he is hungry.

Nous avons tous faim.
We have all hunger.
We are all hungry.



Maman nous donne des pommes.
Mamma to us gives some apples.
 Mamma gives us some apples.

Toutes les pommes sont rouges.
All the apples are red.
 All the apples are red.

Elles viennent de notre jardin.
They come from our garden.
 They grew in our garden.



Bébé laisse tomber la sienne.
Baby lets to fall his.
 Baby lets his fall.

Il recommence à pleurer.
He begins again to to cry.
 He begins to cry again.



Papa se baisse pour la chercher.
Papa himself stoops in order it to look for.
 Papa stoops in order to look for it.



Papa donne la pomme à bébé.
Papa gives the apple to baby.
 Papa gives the apple to baby.

Le train s'arrête.
The train itself stops.
 The train stops.



Papa perd ses lunettes.
Papa loses his spectacles.
 Papa loses his spectacles.

Maman les ramasse.
Mamma them picks up.
 Mamma picks them up.



Nous sommes à Douvres.
We are at Dover.
 We are at Dover.

Nous descendons du train.
We get down from the train.
 We get out of the train.

THE LIGHT THAT SHINES OVER THE SEA



At night, when the moon and the stars are hid, the sailor's way at sea is dark and dangerous. We cannot put lamps at sea as in the streets, but in dangerous places, where a ship might dash on the rocks, great lighthouses are built, from the tops of which huge lanterns throw their warning light across the waves.

The Book of FAMILIAR THINGS

WHAT THIS STORY TELLS US

IN this story we shall learn how a lighthouse is built in the bed of the sea, so strong that the angry waves which dash around it do it no harm, and the sailors can see its light for many miles, and keep away from the dangers against which it warns. We shall learn some of the difficulties with which the builders have to contend, and the care as well as the skill it is necessary for them to employ. The work of building a lighthouse is often very adventurous, and many of the workers have had hair-breadth escapes. We shall learn of some of them here. Many of us who have taken sea voyages believed that we were safest while near shore or in shallow water. Experienced navigators know that nearer land or in shallow water the danger is greater.

HOW A LIGHTHOUSE IS BUILT

ONE of the most wonderful things to think of is the way in which men have been able to make light when darkness creeps over the world. A great city lit up at night is a beautiful sight to look upon. Have you thought, when you have been in the dark, how difficult it must be for the sailor to find his way at sea when the moon is not shining and the stars have shut their eyes? We cannot put lamps everywhere in the sea as we do in the streets, yet there are dangerous rocks which would wreck a ship if the captain did not see them.

There are many places where ships are in danger. There are hidden rocks; there are great cliffs where they may run ashore at night; there are great banks of sand just beneath the water where they may stick fast. The ships have to be guarded from these dangers, and to warn them lighthouses are built. These lighthouses hold great lanterns to throw a bright light over the dark water, and show the sailor the path to take away from danger.

BUILDING A LIGHTHOUSE AMID THE ANGRY WAVES

Lighthouses are built in all sorts of places. Some are on land; some are built out on sea-swept rocks, others again are built on sand. It is no easy task to build a lighthouse. It calls for courage and resolution of the rarest kind, and the utmost skill and devo-

CONTINUED FROM 709



tion and honesty in building. We have sometimes watched with interest the preparations made for the foundations of a great building, and we know with what care they are planned, so that they may bear the weight of the walls above them. The foundations of a lighthouse must be still more carefully planned.

If it is built on a shoal, or a sandy shore, great piles must be driven far down to form a firm base for the lighthouse. Sometimes a huge caisson is towed out to the bank, and there sunk, and filled with concrete which forms a pillar upon which the walls may be built up. This is how the lighthouse on the Fourteen Foot Bank in Delaware Bay was built.

Perhaps the greatest danger is met with in building a lighthouse on a sea-swept rock, and often it is possible to work only when the tide is low. The Minot Ledge lighthouse which stands on a reef at the entrance to Massachusetts Bay was built under great difficulties. When laying the first courses, a small dam was built with bags of sand around the spot where the stone was to be laid. If a wave curled up over this little dam the men had actually to bale the water out, and sop it up with sponges.

Out on the wild, rugged shore of Oregon there is a dangerous rock called the Tullamook on which a lighthouse stands. Until the men who built this were able to set up a crane, they had to be landed from the supply ship by

WHAT TO DO WITH A GIRL'S WORK-BASKET

3. THE DOLL'S LITTLE STAYS

LAST time we made the doll's little chemise; to-day we are going to make the stays, which are made just like a little girl's corsets. A straight band of material, of either twill or coutil, is all that we need. The band should be about 3 or 4 inches deep, according to the size of the doll, and as long as is necessary to go round the body—about 8 or 9 inches.

Fold this piece of material exactly in half to mark the middle of the front, and form a box-pleat about one inch wide. A box-pleat is, of course, made like a very wide tuck which is opened and laid flat in such a way that the stitching comes together in the centre underneath. Tack this down, and then make another tuck half the width of the pleat—an ordinary tuck this time—each side of the box-pleat, and lay them so that they fold outwards. Pictures 1 and 9 explain this quite clearly. When these have been tacked firmly, they should be stitched along each edge with the stitch called back-stitch. This is just ordinary running, except that each time the needle is taken out of the material it is put in again exactly where the last stitch ended, as shown in picture 2. These folds together—the box-pleat and the tuck on either side of it—form the front of the corset and make it firm.

At the back a row of buttons and buttonholes are needed to fasten the little stays together—about four will be enough. On each side of the space for the buttons and buttonholes a pleat is made exactly to match those in the front, as picture 9 shows.

The next thing to do is to make the edge neat at the top and bottom. The best way to do this is to bind them by first laying a piece of silk binding, which is like soft tape,

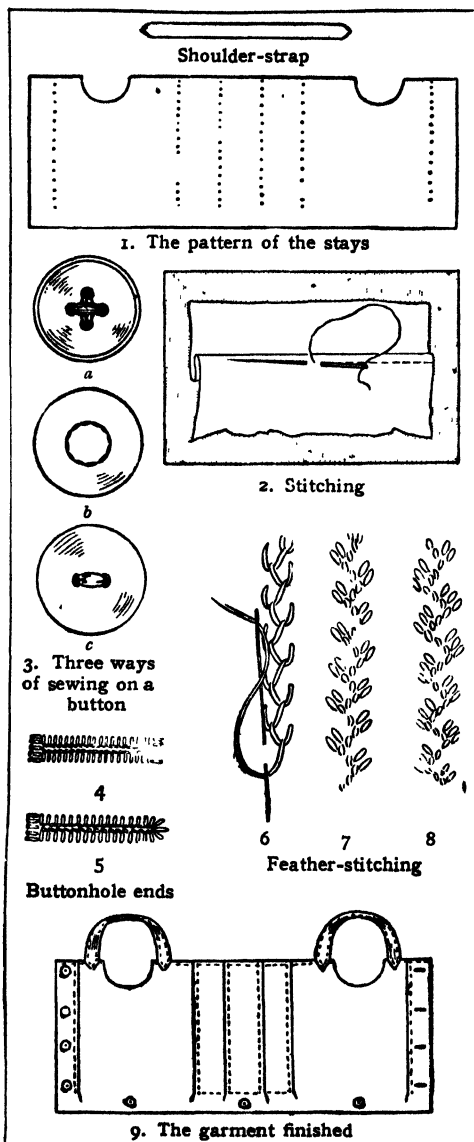
just against the edge on the right side, and running them together. Then turn the binding right over the edge, and hem it neatly on the inside.

The little shoulder-straps are made of a strip of the material folded double and stitched like the tucks, and finished in mitre-point—that is, the little corners are turned inside to form a point.

All that now remains to be done is sewing on the buttons and making the buttonholes. Always remember to use buttons a size smaller than the buttonhole, as this prevents it from being stretched and torn. There are many ways of sewing on a button, but the best way, if you have a linen button which is pierced with four holes, is to take the thread through and through to form a cross, as the button marked *a* in picture 3 shows. If you have a button with no holes in it, make a little ring in pencil round the centre of the button, and follow it all round with little back-stitches, putting the needle through at the back and pulling it to the front. This is shown in *b*. The third way of fastening the button, and the strongest, is shown also in the picture [*c*]. This has two holes with very narrow tape run through and fastened at the back. One piece of tape should thread the whole row of buttons.

The fastening off of the thread when the button is secured in its place is an important matter. First of all,

you should never begin to sew on a button by making a knot in the thread, but start by doing two or three small stitches in the material just where you are going to put the button, and then put the needle through both material and button, and back again. Then raise the button a little, bring up the needle and thread between the material and the button, and



wind the cotton a few times round the sewn stitches to form what is called a stem. This will protect the stitches and make the sewing firmer; it will also raise the button from the material and make the buttoning much easier. The needle should then be put again through to the wrong side, a few back-stitches done, and the thread cut off.

Making the buttonholes will be quite easy, because we have already learned the stitch on page 490; but what we have not yet learned is how to finish off the ends. There is more than one way of doing this, and it all depends upon where the buttonhole is to be put. If it comes in the middle of a band, it should be finished off at both ends like picture 4, but when it is intended to fasten two edges together, like the back of our little stays, only one side need be made firm by buttonhole stitches across the end, because it is only the side nearer the edge that the button presses against. See picture 5.

When we made the front of the little stays, we finished off the edges of the box-pleat and the tucks by back-stitching them, did we not? But there is another way, and a prettier one, to do this, and that is by feather-stitching them, which holds them just as firm as the back-stitch, and looks much prettier.

When starting to learn how to do feather-stitching, the best way is to trace a straight

line from top to bottom of a piece of canvas, and take up each time the same number of threads on each side all the way down. Thread a crewel-needle with cotton, and bring it up on the line; then hold the cotton under the left-hand thumb, insert the needle at a little distance to the right side, about a quarter of an inch higher than the place where the needle came out, and, pointing it in a slanting direction, bring it up on the line a little below the place it was previously brought out. Pass the point of the needle over the thread held by the thumb, and draw the needle and thread through. Repeat this on the left-hand side.

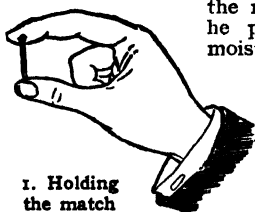
You will now have a stitch on the right side and one on the left. Now again hold the thread down, and make a slanting stitch on the right side, repeat this on the left side, and go on in this way, making one stitch on the right and one stitch on the left, until you have made the length desired. If this is not clear, look at picture 6, which explains much better than words. The thread must not be drawn too tightly, especially if the work has to be washed, in case the material should shrink.

Now, if you want to make fancy feather-stitching, such as shown in pictures 7 and 8, you only have to work two or three stitches, one below the other, on each side of the middle rib, forming double or treble branching.

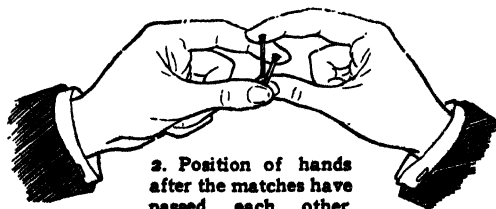
PULLING ONE MATCH THROUGH ANOTHER

IN this trick the performer takes an ordinary wooden match in each hand, held lengthwise between forefinger and thumb, as in picture 1. He brings his hands together, holding them so that the matches are cross-wise to each other. Strange to say, instead of clashing the one against the other when they meet, the one passes right through the other, and the two hands are thereby linked together, each match being now *within* the space enclosed by the match, thumb, and forefinger of the opposite hand. It would seem as though they could not possibly be again separated without dropping one or other of the matches. And yet the performer, by virtue of his magic power, disengages them with the greatest ease, drawing the hands freely apart, quickly or slowly, as may be desired, and re-engages them in like manner, the matches remaining throughout undisturbed between finger and thumb as at first. The trick depends partly upon the kind of match used, and partly upon a little cleverness, which, though by no means difficult, must be practised diligently before the operator ventures to

use it in public. This, by the way, applies to all conjuring tricks. The matches used are those known as phosphorus matches, which we ordinarily use in the house. These are not of the "safety" kind, but have large red heads, into the composition of which a good deal of *glue* enters. The performer prepares for the trick by privately moistening the tip of each forefinger; and, in taking the matches between finger and thumb, he places the "head" end next the moistened forefinger. A little gentle pressure makes the match adhere to the finger strongly enough to carry its own weight. When he brings the hands together, he does so in such a manner that the match in the left hand comes into contact with that in the right, close to the lower, or non-adhesive, end. A slight relaxation of the pressure of the right forefinger lifts the match in that hand away from the thumb in a very minute degree, and allows the match in the opposite hand to pass through the gap thus created. As soon as it has passed, the thumb closes on the end of the match as before. The matches are separated in like manner.



1. Holding the match



2. Position of hands after the matches have passed each other

A BUILDER'S WORKSHOP IN THE SEA

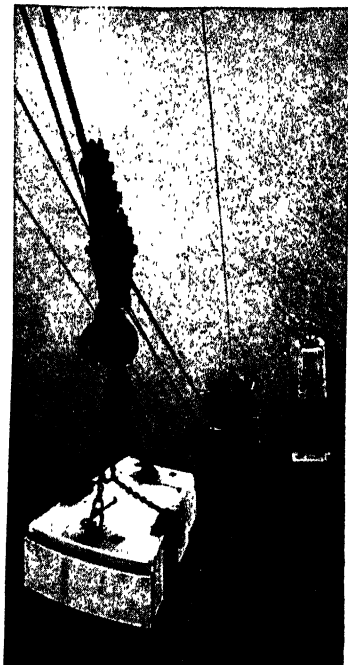
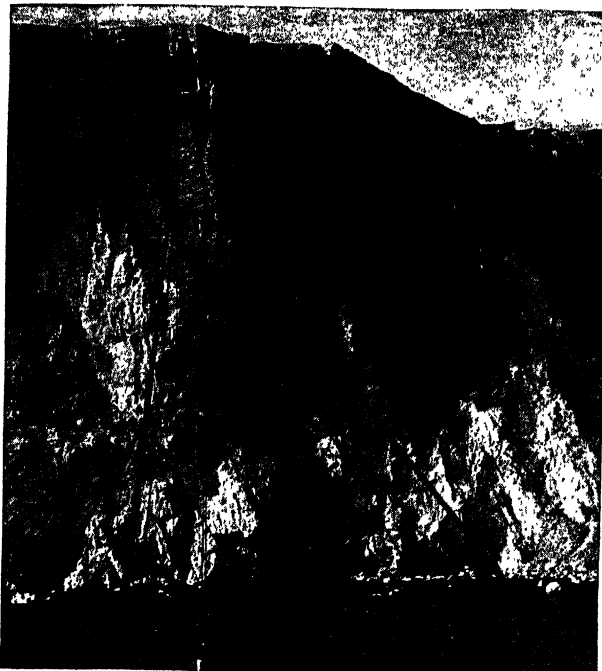


The lighthouse builders waited until the tide was out, and then dug a hole in the sand. They next built an iron platform for their workshop when the tide was in. They could then work whether the tide was in or out.

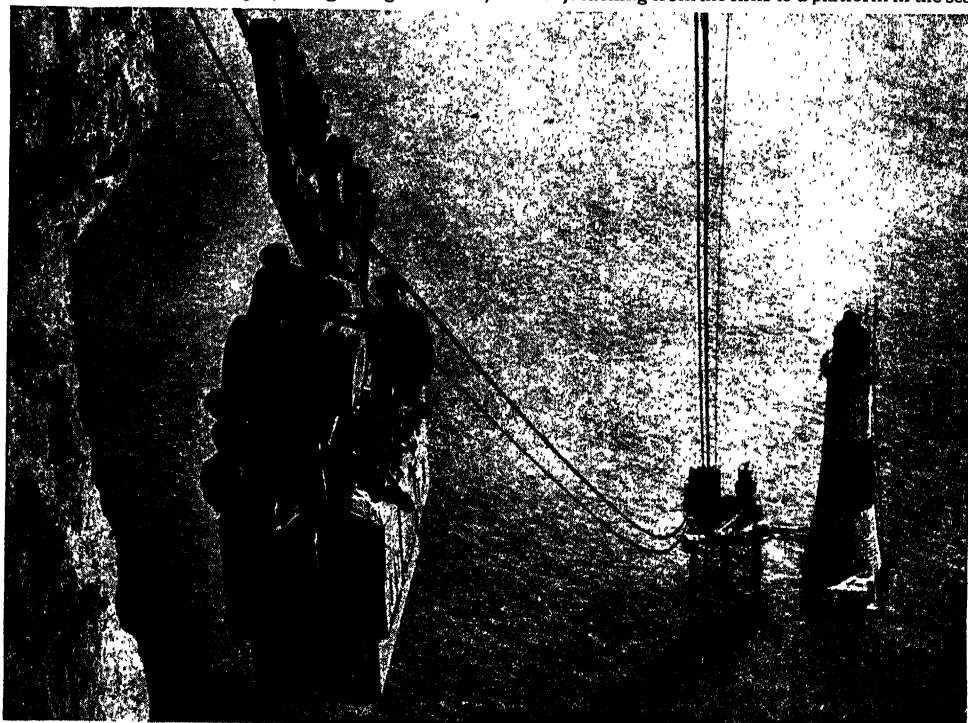


At low tide they went on with their digging and building, and round the hole they built a wall to keep back the sea when the tide came in. Down below, safe inside the wall, they laid the foundations of the lighthouse.

A LIGHTHOUSE RAILWAY IN THE AIR



But how did the men get down from the cliffs ? And how did their stones and tools come there ? They made an aerial railway, with wire ropes, strong enough to bear 1,000 men, reaching from the cliffs to a platform in the sea.



Down this railway came big trucks, carrying the workmen and iron and stone of which the lighthouse was to be made. When the last stone was in its place, the platform and railway were taken away and the lamp in the new lighthouse was lit. Every night the lantern shines to guide the sailor, and keep his ship off the rocks.

These photographs are taken by Weston, Eastbourne. Continued on p. 829.

THE ROYAL MILITARY COLLEGE AND THE CITY OF KINGSTON



The City of Kingston, often called the "Limestone City," has played an important part in Canadian history. Here Fort Frontenac was established in 1683, and the command entrusted to La Salle. The fort was in ruins when the Loyalists reached Canada after the American Revolution, and on its site they built a town which they called Kingston. It is a prosperous manufacturing city, and is the site of Queen's University, one of the best known institutions in the Dominion, and also of the Royal Military College, the buildings of which show across the water. The Martello towers, one of which appears on the right and the other on the left, were built many years ago for the purpose of defence, and served excellently then, though they would not be effective against modern artillery. Kingston was the first capital of the provinces of Upper and Lower Canada, and the first parliament sat there. The harbor is a good one. It is well sheltered by two islands, and has a good dry dock.

Photograph by Notman, Montreal.

THE HISTORY OF CANADA

NOW we begin the story of Canada under English rule. We find that the English were wise enough to give the French inhabitants a great deal of freedom, and that Canada did not rebel when the thirteen Southern Colonies did. During the Revolution, and again during the War of 1812, there was much fighting in Canada, as the British used the country as a base from which to start expeditions. The province of Quebec was divided into Upper and Lower Canada, and some disturbances occurred. Finally, in 1840, the provinces were united, and allowed to govern themselves for the most part.

CANADA AS AN ENGLISH COLONY

JAMES RUSSELL LOWELL once said that the British conquest of Canada made the United States possible. It removed from the thirteen colonies the fear of a northern army which had so long threatened their homes and retarded commercial progress. It increased the feeling of independence among the English colonists and the feeling that they could do without British troops and protection. The bonfires which lit the market-places of the chief American cities with rejoicing were the last of their kind and in the capture of the army of Cornwallis at Yorktown, France obtained her revenge for the defeat of Montcalm upon the Plains of Abraham.

NO IMMEDIATE CHANGE IN THE GOVERNMENT OF CANADA

Under the early British rule, the change in the government of New France, or Quebec as it was now called, was very slight. In 1763, after the Treaty of Paris was signed, a civil governor and a council were appointed. But until 1774, the military influence was supreme and the power possessed by Lord Amherst, who succeeded General Wolfe, and General Murray and Sir Guy Carleton, the first governors, was almost autocratic.

THE QUEBEC ACT (1774)

In 1774, however, the Quebec Act was passed and this made a general change of the government to meet the conditions which had arisen during the decade of British rule.

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By the terms of this act, the province of Quebec was defined as extending southward to the Ohio, westward to the Mississippi, northward to the boundaries of the Hudson Bay territory and eastward to the borders of Nova Scotia. All ordinances issued since 1763 were annulled. It was ordered that in all matters relating to property and civil rights, the old laws and customs of Canada should prevail, but in all criminal cases the English criminal law should be established. It was not thought wise to give the colonists a legislative assembly, so only a legislative council was authorized.

This council was to be appointed by the Crown from persons living in the province. It was not to exceed twenty-three nor to have less than seventeen members. Its powers of legislation were limited. The right to levy taxes was withheld with this exception, that the towns of the province might be allowed to tax themselves for purposes of local improvement. To cover the expense of governing the colony, the old French duties were abolished and in their place duties were placed upon spirits and molasses brought into the province. The Roman Catholics were allowed to worship in their usual way and their clergy were allowed to collect the accustomed tithes from members of that church. The Roman Catholics were also excused from taking certain oaths when appointed to public office. Therefore, it became possible for the

Canadian Seigniors to accept office in the legislative council and a number were at once appointed. As a result the Canadian noblemen remained loyal to the British government.

THE CANADIANS REMAIN LOYAL THROUGH THE REVOLUTION

As we have read in the Story of the United States, trouble began between Great Britain and the New England colonies soon after the conquest of Canada, and the trouble came to a head about the time the Quebec Act was passed. There was not much interest aroused in Canada, however. The people of Quebec, and the clergy, who were grateful for the Quebec Act, were in favor of England. Besides, after the act had been passed, the New England colonists had issued an "Address to the People of Great Britain" in which they complained bitterly of the act as a concession to the French Catholic population of Canada. The Canadians knew of this, and so they paid no heed when the Congress which was sitting at Philadelphia asked them to join in the Revolution. As soon as war broke out, the seigniors promptly offered to enroll as volunteers. The Roman Catholic bishop published a letter in favor of British rule. Governor Carleton issued an order calling out the militia and a small force was collected, though the *habitants*, as a body, refused to fight.

THE INVASION OF CANADA DURING THE AMERICAN REVOLUTION

Soon after the battle of Bunker Hill, Congress determined to invade Canada, and two lines of invasion were adopted. Richard Montgomery with two thousand men descended Lake Champlain and captured Montreal while Benedict Arnold marched through the forests of Maine and reached Quebec. Later the two commanders joined forces and on the last night of 1775 made a desperate assault upon Quebec. They forced their way into the town, but Montgomery was killed, Arnold was disabled, and the assault was finally repulsed. Arnold kept the city under a strict blockade, and when in the early spring General John Thomas arrived with reinforcements preparations for an active renewal of the siege were made. Early in May, however, the British fleet arrived with nine thousand soldiers on board, the city was relieved and General Thomas was obliged to retreat.

CONGRESS MAKES ANOTHER ATTEMPT TO WIN THE FRENCH CANADIANS

The progress of events in Canada aroused much interest in Congress. Washington was anxious that the province should join the revolting colonies. He was afraid that Canada would be made the base for an invasion of New York, and such an invasion, if successful, would divide the colonies. In the spring of 1776, three commissioners were appointed by Congress to go to Montreal to see if they could win the Canadians to their cause. For a time they remained in Montreal and then for their own safety had to return home.

THE AMERICANS DRIVEN FROM CANADIAN TERRITORY

In a rash attempt to gain lost territory, General William Thompson early in June advanced from Sorel against Three Rivers. After landing above the town the American army lost its way, got into a swamp, and in this plight was attacked by the British. General Thompson and about three hundred men were taken prisoners, and no further attack was made on Canada during the Revolutionary War.

CANADA AT THE CLOSE OF THE AMERICAN REVOLUTION

We must remember that at this time, Canada, as we now know it, did not exist. Few people knew of the forests and fertile valleys of British Columbia, the western plain was believed to be a frozen, howling waste, and Ontario was still covered with dense forests, the haunts of Indians and trappers. Quebec and Nova Scotia with the little province of Prince Edward Island were the only inhabited parts of the country, and even in these provinces, except on the seaboard, and along the banks of the St. Lawrence, the population was sparse. But the Revolutionary War brought a great change. At its close many thousands of people who had not approved of the Revolution, and desired to live as British subjects, left the United States, and by far the greater number went northward and settled in the British provinces.

Nova Scotia, which was under the rule of a governor and an assembly, had made rapid progress, and this province was the goal of many of the Loyalists, who settled for the most part along the River St. John. This large migration made a division of the province advisable, and in 1784, New

YORK, NOW TORONTO, MORE THAN A HUNDRED YEARS AGO



This is a picture of the little town of York, the site of the present city of Toronto. York was burned by the Americans in the War of 1812, but was rebuilt, and the population increased so rapidly that it numbered 9,000 in 1834, when its name was changed to Toronto. It is now the second city in Canada in importance and population. The city has a fine harbor which is protected from the lake storms by an island at its entrance.

Brunswick became a province with an assembly of its own.

When Prince Edward Island, which the French called the Island of St. John, was ceded to Great Britain in 1763, its population consisted of about thirty Acadian families. In 1767, the island was given in separate grants to a number of friends of the English government and two years later it was declared a separate province with a governor and an assembly. It was given its present name in 1799 in honor of the Duke of Kent.

Even before the Revolutionary War was over thousands of Loyalists traveled northward to make new homes in the Canadian forests beyond the Great Lakes. To these were added numbers of English soldiers who settled along the St. Lawrence and the northern shore of Lake Ontario, and to these first settlers liberal grants of land were made. All this country was then part of Quebec, but the colonists, who were nearly all English or of English descent, did not like being ruled by a mixture of French and English law. The fact was that they wanted the right to govern themselves and their dissatisfaction became so great that it was finally decided to divide Quebec into two provinces, and give each a government of its own.

QUEBEC DIVIDED INTO UPPER AND LOWER CANADA

To do this a law, which is known as the Constitutional Act (1791), was passed by the British Parliament. The act divided Quebec into Upper and Lower Canada, and the next year (1792) a royal proclamation fixed the boundary line between the two provinces, which are now known as Ontario and Quebec.

For each of the new provinces a parliament was provided, which consisted of a legislative council, appointed by the governor, and a legislative assembly, elected by the people. The king was represented in each province by a governor or lieutenant-governor, whose assent was necessary to all acts of the provincial legislature.

The legislative council of Lower Canada was to have not less than sixteen members and the council of Upper Canada not less than seven. The legislative assembly of Lower Canada was to consist of not less than fifty members and that of Upper Canada of not less than sixteen. Lower Canada kept its French

laws and customs, while Upper Canada at once introduced the English law to which the people had been accustomed.

TROUBLES IN THE PARLIAMENTS OF THE TWO PROVINCES

The first parliament of Lower Canada met at Quebec on the 17th of December, 1792. On account of the difference of race, religion and language one would expect serious problems to arise. As a matter of fact they did, and though for a few years all went smoothly, a struggle began between the English legislative council and the French assembly, with the opening of the new century. Gradually the disputes became violent, and by 1812 an intense racial hatred existed between the French and the English.

The first assembly in Upper Canada was called together at Newark (now Niagara) on the 17th of September, 1792. Its first act was to establish the English civil law. Later York (now Toronto) was chosen as the capital and parliament met there for the first time in 1797.

During the early years of the province there was little trouble. The people were all Loyalists whose chief interest was the building of homes in the wilderness. Later, however, radicals came from Scotland, liberals from England and republicans from the United States. The new settlers were business men and filled with democratic notions and a conflict arose between the old Loyalists and the new reformers.

CANADA AND THE WAR OF 1812

For a time, however, differences were forgotten in the War of 1812, between the United States and England, in which Canada was again invaded by American armies.

The reasons usually given for the War of 1812 are the famous Orders in Council, by which England declared a blockade of the whole European coast, and the claim to "right of search," by which the English claimed the right to board neutral ships in search of deserters from the navy. It was also claimed that the Canadian governor had sought to rouse the Indians in the West, a charge that Canadians have always steadily denied. Naturally the Orders in Council and the "right of search" caused much irritation, but the real causes of the war lay deeper. Many Americans had still a warm sympathy for France, their old ally in the

struggle for independence. There was still the old hatred of Revolutionary days which created a desire to acquire British America. Few Americans realized that the Canadian Loyalists had deliberately chosen a country and a government of their own, and most of them had a strong belief that the conquest of Canada would be an easy matter.

DETROIT CAPTURED BY CANADIANS

Preparations were made for the invasion of Canada. General Hull was to cross the Detroit River, General Van Rensselaer to attack Niagara and Commander-in-Chief Dearborn to march against Montreal. The Canadians put forth every effort to resist the invading army. Sir Isaac Brock, who was in command of the force of Upper Canada, marched with the Indians under Tecumseh against Hull, who was stationed at Detroit. Before an attack could be made Hull and his entire army surrendered.

THE AMERICANS WIN AN IMPORTANT NAVAL VICTORY

The first half of the year 1813 was very favorable to the Canadian army, but the tide turned in September when Perry won a naval victory over the English fleet under Captain Barclay. This victory on Lake Erie enabled Harrison to enter Canada and he defeated Colonel Procter and Tecumseh at Moraviantown, where the Indian chief was killed. In the same year the Americans were defeated at Chateaugay and Chrysler's Farm.

The next summer, the Americans attempted to invade Canada by way of Niagara River. Jacob Brown and Winfield Scott crossed the river, and fought the battles of Chippewa and Lundy's Lane, but were forced to retreat to American soil. At the same time, the British were defeated at Plattsburg. The war was very unpopular in many parts of the United States. Both sides were weary of fighting and on Christmas eve, 1814, a treaty was signed at Ghent which left the boundaries as they had been before.

THE REBELLION OF 1837 AND WHAT LED TO IT

The war was thus happily ended, but the young country had more troubles to go through before it became a united nation. As we have seen there were two councils in each province as well as the legislative assembly and in addition there

were a number of government officials. Naturally the councillors were chosen by the governors from among the more prominent men, and gradually these men got most of the power into their own hands, and were able to persuade the governor that what they wished was the best policy that he could follow. In Upper Canada this little group of men was called the "Family Compact," in Lower Canada the same kind of group was called the "Chateau Clique."

Naturally the assemblies thought that the councils should not be permitted to control and govern the province completely, and strong opposition soon arose.

In Lower Canada the leader of this opposition was Louis Papineau. He demanded that the permanent officials of the Crown should be free from politics. A bitter struggle followed and Lord Dalhousie, the governor-general, was recalled. Petitions of grievances were sent to England. Parliament appointed a committee to investigate, but its report in 1828 did not please Papineau and his party. Efforts at conciliation failed and in the assembly Papineau boldly denounced monarchy and British rule and commenced to plan for a French republic.

Meanwhile a crisis was reached in Upper Canada. There the leader of the opposition was William Lyon Mackenzie, a newspaper editor, who for years was very popular with the people. He was expelled from the assembly several times, but was as often re-elected, and in 1834 had control of the assembly, and a petition of grievances was sent to England. Two years later he was defeated, chiefly because he was opposed by the moderate reformers under Dr. Egerton Ryerson, and in his disappointment Mackenzie deliberately planned rebellion.

In Lower Canada the rebellion broke out in October and was quickly suppressed. Papineau fled from the country. The rising in Upper Canada was still more feeble. Mackenzie, too, was forced to flee, but succeeded in reaching the American frontier. The English government realized that reforms must be made. Lord Durham was sent out as governor-general with full power to restore peace. He made a report which served as the basis of the Act of Union (1840) and soon a great degree of self-government was granted to the province.

THE NEXT STORY OF CANADA IS ON PAGE 1271.

THREE BEAUTIFUL PAINTINGS OF JESUS



THE BIRTH OF JESUS, AS PAINTED BY THE GREAT ITALIAN ARTIST, CORREGGIO



THE CHILD JESUS AND HIS MOTHER
PAINTED BY RAPHAEL



JESUS AND THE TRIBUTE MONEY
PAINTED BY TITIAN



SHAKESPEARE

The Book of MEN & WOMEN

MILTON



Venice, the city rising out of the sea, as painted by Turner.

TWELVE GREAT PAINTERS

TO be a great artist is one of the grandest things in the world. Some pictures bring tears to our eyes by their sadness. Others seem to tell us a fine story, or show us a scene in which everything seems to be alive. Another will show us a portrait of a man who looks so real that we think he is going to speak to us.

And so to-day we can look upon pictures of the world that have been painted by the men who lived in it, as if the artist were still alive, lending us his eyes, through which we might see the things he saw.

Leonardo da Vinci was wiser than most men of his time. As a painter he had a wonderful sense of beauty. He thought out most beautiful things and painted them in a life-like way. He did not only draw lines; he painted his pictures so that we *feel* much more than we *see* when we look at them.

Many great men have tried to teach the world how pictures ought to be painted, but everything that they are able to say was said by Leonardo da Vinci. What he wrote about art is the foundation of the artist's learning. He was one of the most wonderful men who ever lived. He not only painted pictures but wrote about them. He was a great engineer and inventor. It is said that he

CONTINUED FROM P. 669



traveled from Florence to Egypt to be an engineer there.

He invented many wonderful things. All the beautiful Carrara marble from which statues are made to-day is cut with a machine that he invented. He had enough brains for twenty men; but he thought out so much that he could not get all of his great works done. Some of the pictures which he painted are among the greatest in the world, and all the great painters of Italy who came after him made their fame by copying his example.

Who was the greatest painter who ever lived in the world? Some people say Raphael. Others say Titian. At any rate, Titian was one of the greatest. He was the greatest painter in color that ever lived; and whatever he painted he did splendidly and well, whether it was a portrait, a picture of his fancy, a religious painting, or a thought that he tried to put into color. His colors are full of meaning.

By the time he was twenty-four his pictures had made him known, not only in Venice, near where he was born in 1477, but all over Europe, and kings paid him large sums of money to visit great cities and paint for them. Although it is so long since his pictures were made, the

JULIUS CAESAR

HERBERT SPENCER

colors are as fresh and rich and lovely now as they were then.

So much was he admired at the Court of the Emperor Charles V. that the noblemen were jealous of him. "Ah," said the emperor, "I have many nobles, but only one Titian!" One day the artist, when talking to the emperor, dropped his pencil, and the emperor, who was one of the proudest men in Europe, stooped and picked it up, saying that it was an honor to serve so great an artist.

TITIAN'S PICTURE, THE GREATEST TREASURE AT THE COURT OF SPAIN

A terrible fire broke out in the palace of the King of Spain, and when the king was told of it he asked if they had saved Titian's great picture of Venus, which had been hanging in the palace. They answered that they had saved it. "Then I can bear all my other losses," the king said.

The only man whose fame is as great as Titian's is Raphael, who was born in Italy in 1483, and was alive at the same time as Titian. As a boy Raphael studied under a great painter, but he was soon able to paint so much like his master that now, when we see pictures done by both of them, it is hard to say which is Raphael's and which is by Raphael's master.

The boy was really a greater painter than the man who taught him. Raphael studied all the great painters who had lived before him and copied all their best ideas. He put all these ideas into his own work, and, though he did not think out new subjects for pictures, he painted pictures that seem almost perfect.

The great and beautiful home of the Pope in Rome is called the Vatican, and Raphael did many of the wonderful paintings there. He was an architect, too, and drew the plans from which St. Peter's at Rome, the grandest church in the world, was altered.

RAPHAEL, WHOSE WONDERFUL PICTURES WERE THROWN AWAY

While Raphael was working for the Pope he made some drawings called cartoons, from which famous weavers were to make tapestries, or wall carpets, to hang upon the walls of a chapel. When the tapestries were made, they were so wonderful that people looking at them thought they were paintings.

Years rolled away, and the King of England bought the cartoons. So fine did people think them that they actually built a factory and sent for many clever workmen to come and make the tapestries which Raphael had drawn. Then came another king who did not know how precious they were, and as nobody understood them they were treated as rubbish and lost. One day a clever man found them, and saw what they were, and they were then thought so much of that \$2,500 was spent in making the frames to put them in. Money could not buy these drawings now, but one may see them at the South Kensington Museum, London.

Many painters have come to be known by the name of the town in which they were born, or the place where they did their best work. This was so with the famous artist Correggio. His real name was Antonio Allegri, but he is known by the name of the town where he was born. Some of the best pictures in the world were done by him. One he did for the home of the monks at Correggio.

CORREGGIO, WITH THE SECRET OF LIGHT, AND RUBENS, WITH THE BIG BRUSH

Artists were not very well paid in those days, and Correggio was paid less than \$250 for a picture over the altar of the convent. One dark night thieves broke in and stole the picture. The people of the town were very sad when they heard of the loss, and two hundred people, rich men and poor men, went to the governor of the town and asked that the picture should be found and given back. But the governor could not get it back; so the people sent to the Pope and to everybody likely to help them. Still nothing could be done, and the picture, carried perhaps into some rich man's palace, was never heard of any more.

Correggio learned the great secret of how to show in a picture the effects of light. Rembrandt's pictures show this too, but Correggio's light is much softer and gentler than Rembrandt's.

Another great artist was Peter Paul Rubens, a Dutchman. His father, who was a very poor sort of person, died while he was a child, but his mother had him well educated. When he grew up he was so fine a gentleman that he could have made his fortune as an ambassador, had he not loved painting. His services as

TWELVE OF THE WORLD'S GREAT PAINTERS



Da Vinci painted in a life-like way. He makes us *feel* much more than we *see* in his pictures.



Titian was the best color painter who ever lived. His colors are wonderful and full of meaning.



Raphael copied the best ideas of other painters, and painted pictures that seem almost perfect.



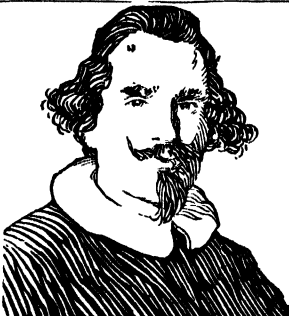
Van Dyke had more feeling than his great master, Rubens. His colors blend in beautiful harmony.



Rubens made a fine show by using a big color brush. He was content to make us *see* rather than *feel*.



Correggio knew how to show the effects of light. His light is softer than that of most other artists.



Velasquez was clever in making us see the chief things in his picture, in which he put nothing unnecessary.



Rembrandt painted a man as a man is—so that we feel he is natural, and part of everything around him.



Hogarth's pictures show the vulgar side of life. He had a wonderful way of showing real character.



Gainsborough's fine portraits of handsome people really help us to understand the life of his time.



Reynolds used color better than any other man then living. His portraits are bold and strong.



Turner stole the sunshine and put it in his pictures. No other artist ever painted sunlight so well as he.

an ambassador were much wanted, so Rubens went about from Court to Court to do duty for those who sent him, and while visiting a Court he would settle down and paint. Rubens is called a great decorative painter. He made a fine show by using a big brush with plenty of color. He painted ordinary things exactly as they seem to us when we do not think and try to understand their meaning. He was satisfied to make us *see* people, without trying to make us *feel* that they are real.

VAN DYKE, THE DUTCH PAINTER AT THE ENGLISH COURT

Anthony Van Dyke was born in Antwerp, where Rubens lived, and studied art under him. But he had much more feeling than his master. His colors are soft and "cool," and not glaring like those of Rubens, and they blend in beautiful harmony, as notes in music do.

The English lovers of art thought a great deal of his work. Charles I. made him Court painter, and Van Dyke painted portraits of the Royal Family and of most of the great people in England. He did not live in England always, but used to go to the Continent for long holidays. No doubt he was glad to paint on the Continent, because he could not always get paid for the work which he did for the Royal Family in England. This was a great shame, for he did a picture that is famous all over the world. It is the portrait of Charles I. on horseback, and is in the National Gallery. Van Dyke died a poor man, but he was buried in St. Paul's Cathedral, before it was burned down in the Great Fire of London.

VELASQUEZ, WHOSE SPLENDID PICTURES HUNG ON GLOOMY PALACE WALLS

Velasquez was the greatest artist ever produced by Spain. He painted pictures exactly as he saw them and painted them rapidly, without thinking them out as Leonardo da Vinci did. Yet, though they came to him so quickly, he had a wonderful way of making us see the important things in his picture, and he never put in anything which could be left out.

Velasquez had to teach himself. All painters in Spain at that time painted in one style, and that was a bad style. Velasquez went to a master who was painting in a different and better way.

But this master was very cruel, and beat him, so he soon left and set to work to learn for himself the way to paint.

Over and over again he tried, until at last he was able to make a lovely picture called the "Water-Seller." This was shown to the King of Spain and at once made Velasquez famous. His splendid works were hung upon the gloomy walls of the Royal palaces in Madrid, and the world did not know until more than two hundred years later what a great artist he had been.

Then the French Army captured Spain, and the soldiers found the pictures in the palaces. When the Spaniards drove the French out again, King Jerome Bonaparte, a brother of Napoleon, carried off the "Water-Seller" in his carriage. But he was caught, and the picture was taken from him on a battlefield. The King of Spain gave the "Water-Seller" to the Duke of Wellington for driving his enemies away, and the picture was brought to England and hung in the duke's house near Hyde Park.

REMBRANDT, THE MILLER'S SON, WHO PLAYED PRANKS & PAINTED PICTURES

Another great Dutch artist was Rembrandt, the son of a miller. His work is very grand and famous, but in his lifetime people did not think as much of him as they do now. He was quite poor.

He was a man of great pranks and frolics. Once he was painting the portraits of a rich family. While he was doing so, someone opened the door of his room and brought in the dead body of a monkey. The creature looked so funny that Rembrandt felt he must paint a picture of it. The only thing on which he could make the drawing was the canvas on which he was painting the portraits of the rich people who were waiting. Although they were angry, he painted the monkey in among their portraits.

Rembrandt painted portraits as they had never been painted before. There are two ways of painting a man. He may be painted so that we *see* he is a man by his shape and form, or so that we *feel* he is a man because he is natural and seems to be a part of everything around him. Rembrandt painted in this way, and his portraits look almost alive.

PORTRAITS BY FOUR GREAT PAINTERS



NELLY O'BRIEN, BY SIR JOSHUA REYNOLDS



REMBRANDT'S PORTRAIT OF HIS DAUGHTER



PORTRAIT BY HANS HOLBEIN, THE YOUNGER



A PORTRAIT BY VAN DYKE

Some men preach sermons in the pulpit, some preach sermons in books and papers. William Hogarth was an Englishman who preached sermons by his pictures. He used to paint pictures which made people feel ashamed of being wicked and vain. Hogarth painted coarse and vulgar things, and his pictures show us very clearly the lower and sadder side of life. He had a wonderful way of showing the real character of people in portraits.

HOGARTH THE APPRENTICE, AND GAINSBOROUGH, WHO SKETCHED A THIEF

Hogarth was born quite poor, and was a silversmith's apprentice. When his pictures made him a rich man he bought himself a carriage, and went to see the Lord Mayor of London. When he came out he forgot all about the carriage. It was raining, and he called a cab, but could not get one. So off he ran in the pouring rain, and not until he got home did he remember that he had left his carriage outside the Lord Mayor's house!

Thousands of dollars are now paid for a picture by Thomas Gainsborough. But when he was a boy, living in an English village, nobody ever thought he was going to be a famous artist. He loved drawing better than his school lessons, and, instead of playing with other boys, would wander off into the fields and woods to study the flowers and trees, the sunshine and shadows, the birds and the fishes.

One day he saw a man looking over his father's orchard, as though he would like some of the pears hanging there. Little Thomas pulled out his pocket-book and drew a picture of the man. That night the orchard was robbed. The boy's sketch was shown, and it was found that the man whom he had drawn was the thief.

THE WONDERFUL PORTRAITS PAINTED BY GAINSBOROUGH & SIR JOSHUA REYNOLDS

This seemed so clever of the boy that at last his father made up his mind to let him be an artist, and he became one of the greatest artists ever known in England. Gainsborough painted fine portraits of handsome men and women, in which we see the extravagant manners and gay dresses of the people; and he has painted pictures that really help us to understand the life of his times.

England has never had a more famous painter of portraits than Sir Joshua Reynolds, who knew how to use color better than any other man who lived at that time. But, alas! the materials that he used were not what he thought them, and the colors are fading. His portraits have a bold and vigorous feeling, and suggest strength rather than daintiness like Gainsborough's.

When he was twenty-one he caught a cold which left him deaf for life, and before he died he became almost blind, so that his last years were very sad. But he was a great and clever man, and, besides being a painter, he was a fine writer. His lectures on art are still read.

He was much beloved by all the great men of his time, but this did not make him vain. To the end of his life he was always trying to make his work better and better.

TURNER, THE MAN WHO STOLE THE SUNSHINE AND PUT IT IN HIS PICTURES

Among the most wonderful pictures at the National Gallery in London are those by Turner. Nobody would think that they are the work of a poor London barber's son, who was so badly educated that he could not even spell. His father meant him to be a barber, but the boy was a born artist, and used to make little drawings which his father sold for about 25 cents or so each. He would sometimes walk miles to sell a picture for less than a dollar.

When he was sent to the Royal Academy to study he soon made himself famous. His pictures of landscapes and of the sea, and rivers, clouds, and sunshine, are marvelous. Turner was what somebody has called an artist in yellow. He stole the sunshine and put it in his pictures. No other artist has ever painted the sunlight so well.

His life was not happy. He made a great deal of money, but he did not use it well. He was very shy, and used to live in a cheap little house, calling himself by a name that was not his own, so that people would not be able to find him.

Although he was such a curious man and unsociable while he lived, he left large sums of money to the poor, and gave all his pictures to the nation.

THE NEXT STORIES OF MEN AND WOMEN BEGIN ON PAGE 865.

FOUR PEEPS AT THE PAST THROUGH OTHER EYES



A SHRIMP GIRL, PAINTED BY HOGARTH



A GIRL PAINTED BY GAINSBOROUGH



A BOY AND HIS DOG, PAINTED BY
VELASQUEZ



A MOTHER AND HER CHILD, PAINTED BY
RUBENS

KING RICHARD GIVING UP HIS CROWN



King Richard II. angered his people by trying to govern without a Parliament, and at last he was forced to resign his crown to Henry Bolingbroke. In this picture we see Richard giving up his crown and sceptre. He then signed a statement that he was no longer worthy to be king. This was laid before Parliament on the next day, and the throne was declared vacant and given to Henry Bolingbroke, who became Henry IV.

The Book of ALL COUNTRIES

ENGLAND FROM EDWARD I. TO EDWARD VI.

THERE is a famous saying that "uneasy lies the head that wears a crown," and the words are put by Shakespeare into the mouth of Henry IV., one of the kings whose troubled lives come into this story. This story tells us of long struggles for the crown of England. We see that the first care of kings has not always been the welfare of the people, and that rulers have not always sought to make nations happy. These pages tell us of the life of England for 200 years, and in this time many important things happened. The people of Wales were conquered, but the people of Scotland refused to be conquered. There were long wars between England and France, in which gunpowder was used for the first time. All this time the lives of the kings were very much troubled, but out of all this turmoil a great and strong nation was gradually being built up.

FIGHTING FOR THE CROWN

WHEN Prince Edward left England, and his old father, Henry III., to go and fight in the Crusade, his young wife, Eleanor, pleaded to go with him. It was in vain that he told her how dangerous the journey was, and how uncomfortable she would be on board ship, or living in a tent. She only answered that "the way to heaven is as near from Palestine as from England." So the Princess Eleanor had her way; and the story goes that she was able to save her husband's life.

A man, sent by the enemy, stole into his tent one hot, stifling day, when he was resting with his heavy armour off. Before the prince realized what was happening, the man, pretending he had a letter to deliver, struck at him with a poisoned dagger. Eleanor rushed forward and sucked the poison out of the wound, and had the joy of seeing her husband recover, after some days of anxious illness. After this they had to journey home again, for Henry was dead, and the prince was now Edward I.

It was Edward who prepared the splendid double tomb of marble for his father, once sparkling with gold and jewels, but now so dusty and grey, close by Edward the Confessor's shrine in Westminster Abbey. He also carried on his father's work by pulling down part of the old Norman

CONTINUED FROM P. 596



Abbey, and building it up again in the new style. Edward made many good laws, and arranged different courts to deal with the various matters of government. He also took good care that real justice should be done, and sent away judges who were found to be dishonest.

Early in his reign he had bitter fighting with the Welsh. The Britons, as you will remember, had found shelter long before amongst the beautiful hills in the west from both Romans and Saxons; and their children's children defied all attempts to join their land to England.

The English lords who lived on the borderland had great difficulty in preventing the Welsh from carrying off their cattle and whatever else they could find, and followed them, when they could, back to their hills to punish them. There is a little railway now up to the top of Snowdon, and other lines wind about the valleys, and coaches run from place to place. As one travels about these hills, it is easy to understand what fine hiding-places the Welsh had, and how the beauty of the country and the splendid strengthening air made the owners do their best to keep it to themselves.

But Edward was clever and determined, and in the end succeeded in becoming master of the country, so that at last he was able to hang up

before the shrine of his namesake, Edward the Confessor, the crown of Llewellyn, the last Welsh prince.

When the nobles came to pay homage to Edward, he promised to give them a prince as ruler, born in Wales, who could neither speak French nor English. He then brought out to them his little son, born at Carnarvon Castle a few days before! Ever since, the king's eldest son has been Prince of Wales.

HOW EDWARD THE FIRST TRIED TO UNITE ENGLAND AND SCOTLAND

Edward's great wish was to rule over the whole island of Great Britain, as it had been that of Henry II. before him. He wanted the Scottish king to do homage for all his kingdom, but the Scottish king steadily refused.

To try to make the kingdoms one by peaceful means, Edward proposed to marry his son to the Maid of Norway, whose mother was the daughter of the Scotch king. But the little girl, Margaret, the last of her family, died on her way across the stormy North Sea. If she had lived, it might have saved much misery during the years that followed, when Scotland was helped by France to resist England, and there was constant war between these countries.

Disputes soon arose as to who should rule in Scotland after little Margaret died, and Edward claimed the right of settling them. Naturally, the Scotch did not agree to this, and fought hard to get their own way. During ten years Edward made three campaigns in Scotland. Many of the battles were fought near that narrow part of Scotland between the Forth and Clyde, now so busy with coal-mining and manufactures, and so thickly crossed with railway lines. Stirling in the old time was the key of the road to the Highlands, with its fine castle hill, and the Abbey Craig near by, now crowned with a monument to the great Scotch patriot, William Wallace, who fought against Edward and gained a victory over the English nearby.

THE GOOD QUEEN WHOSE MONUMENT STANDS AT CHARING CROSS

The same year that the Maid of Norway died, Edward lost his beloved queen, Eleanor. To mark his grief, and the honour in which he held her, he built crosses wherever her body rested on its way from Nottinghamshire to Westminster Abbey. Three of these are still

to be seen. The site of the last is quite near the Abbey. Green fields and a few country houses were its surroundings then; now it lies in the midst of London, where myriads of hurrying feet pass to and fro by the great railway station at Charing Cross. Edward raised a beautiful tomb for his queen at his father's feet. His own, on the other side of his father, is a very plain, large one.

A few feet from where he lies is the ancient coronation chair made by him to enclose the famous stone that he brought from Scotland, on which the kings of that country had been crowned for centuries. Edward's chair was painted and decorated with false jewels when new. Now it looks very dull and worn, but is covered with cloth-of-gold when moved out before the altar for a sovereign of England to be crowned in it. Round the stone run these words, engraved upon it:

If fates go right, where'er this stone is found,
The Scots shall monarchs of that realm be crowned.

We shall see later how and when these words came true, but it was not until three hundred years after Edward I. had laid down his sword.

ROBERT BRUCE, THE HERO-KING OF SCOTLAND, AND THE GREAT FIGHT HE WON

The chief battle in the reign of the son of Edward II. was fought at Bannockburn, within sight of Stirling. It was a wonderful day. Robert Bruce, the hero-king of Scotland, rode up and down on his brown pony—a battle-axe in his hand, a gold crown on his head—encouraging his soldiers, whom he had arranged in the best possible way. Robert had not half as many men as Edward, but before night fell the Scotch were free again; and Edward II. left so much treasure behind that the Scotch became rich as well as free in this one day.

Edward II. ruled so badly that he was made to give up the crown, and his son of fourteen was chosen king in his place. He was Edward III.

A great deal happened during the fifty years of his reign. He began by marrying Philippa when only fifteen.

Her husband was away a great deal, for wars with Scotland and France were incessant. He invaded Scotland again and again, and succeeded to a certain extent, till France helped the Scots. Then troubles broke out in

THREE SCENES IN THE LIVES OF THREE KINGS



King Edward I., preparing to make war with the Scots, collected his forces at Carlisle, to lead them northward. But he fell ill, and at Burgh-upon-Sands, resting by the wayside, just within sight of Scotland, he died.



Piers Gaveston was a great friend of Edward II., the first Prince of Wales, and gained so much influence over him that he was banished. But when Edward became king he sent for his favorite back again.



When Edward III. was at war with France, he was opposed by Philip, King of France. On reaching the River Somme, he broke through an opposing force, and crossed in time to avoid being captured.

that country, as Edward claimed to be the rightful king of France, through his mother. We must remember the names of some of the great battles that followed. The account of them is to be found in a chronicle written by an Oxford doctor, to be seen amongst the chronicles of England in the British Museum. Every year he wrote down the events as they happened. His name was Adam Murimuth. England's first great sea victory over the French took place at Sluys, and most exciting it must have been. The French king's men found it very hard to tell him what men and ships he had lost.

THE GREAT BATTLE AT CRESSY, WHERE GUNPOWDER WAS FIRST USED

Later followed the great battle of Cressy, in France, fought amidst thunder and lightning and torrents of rain, and an eclipse of the sun. It is said that the English had four cannon with them, and that this was the first time gunpowder was used in battle. If so, the loud noise of the firing would add to the terrors of the day. The arrows of the English fell fast and thick as flakes of snow; the men who came to help the French fell back, and soon all was in confusion. Edward's eldest son—barely sixteen—led in the fight, and won the spurs of a knight that day.

You perhaps know the three feathers, with the German motto below, "I serve," used as a crest by the Prince of Wales? It was this "Black Prince," so called from the color of his armor, who took this crest to put on his shield at the battle of Cressy. It had belonged to the brave and blind old King of Bohemia, who cried, "I pray and beseech you to lead me so far into the fight that I may strike one good blow with this sword of mine." He was found dead on the field.

HOW QUEEN PHILIPPA SAVED THE SIX BRAVE MEN OF CALAIS

Then for nearly a year Edward tried to take the town of Calais, whose white cliffs can be seen from Kent. Kent has been called the window from which to look out on Europe; and Calais has been called the door into France. Little wooden houses were built all round the town for the soldiers, and no one could pass food through. At last the people were starving, and had to give in to the English.

Edward said that six of the men of Calais must come and give their lives, and then he would let the rest go free. So one after another brave man offered to go, and the six came to Edward with ropes round their necks. Can you fancy how the wives and children of these men felt as they saw them go to the English camp? Edward would not listen at first when asked to spare them, but shouted, "Call the headsman! They of Calais have made so many of my men die that they must die themselves."

Then Queen Philippa herself knelt before the angry king, and, with tears raining down her face, said to him, "Ah, gentle sire, from the day I passed over sea in great danger I have asked you nothing. Now I pray and beseech you, with folded hands, for the love of Christ, to have mercy on them."

The king kept silence for a while, then his heart softened, and he put the ropes of the six citizens into her hands. How happy Philippa must have been, as she cared for them, giving them fresh clothes and a feast, and presents before they went away!

THE MISERY OF THE PEOPLE AND THE HONOR OF A CAPTIVE KING

But the unhappy war went on. Hundreds and hundreds of soldiers crossed the Channel, to die away from home. Presently it became difficult to find enough men to till the fields, and there was a great deal of poverty and discontent everywhere. A terrible sickness, too, called the Black Death, swept over the country, till nearly half the people died. The rich people did all they could to keep wages low.

The state of France was just as miserable, with land uncultivated and towns in ruins, for people were driven away from their homes, and many of their goods were taken by English soldiers. An old writer said that there was no woman who had not garments, furs, feather beds, and utensils from the spoils brought home by the army.

After the next great battle, Poitiers, the Black Prince took the French king prisoner. The story is told that the captive was mounted on a fine white horse, while the prince rode beside him on a pony, and that he stood respectfully behind his chair at table.

The king went home to try to collect

the enormous sum asked for his ransom, and, being unsuccessful, came back, for he was an honorable man, to end his days in England.

Edward, the Black Prince, died before his father. His tomb is to be seen in Canterbury Cathedral, with his black armor hanging over it. One good thing that Edward did for England was to encourage the woolen trade. He saw that sheep flourished well, and that there was plenty of water to be had, but that people sent away most of the wool to other countries to be made into cloth. So he invited some clever workers to come over the Channel from Flanders—Philippa's country—to settle in the east of England and gather English people round them to learn to make woolen goods as well as they did. This was the beginning of the great woolen trade in Yorkshire.

CHAUCER, THE GREAT POET, AND WYCLIF, THE GREAT REFORMER

We can gain a most interesting sight of these times from an old writer named Froissart, who lived much at Edward and Philippa's Court. The father of English poetry—Chaucer—lived, too, in Edward's reign and that of his successor. You can see his tomb in Poet's Corner in the Abbey. His English is difficult to read, because the language has changed so much since those days, but some of his tales are given on page 493.

Most amusing and delightful pictures of the people does Chaucer draw, and we learn much about the customs of the time from them.

The great reformer Wyclif lived also in this fourteenth century. He has been called the first Protestant, because he dared to protest or speak against what he believed to be wrong. He directed the translation of the whole Bible into English.

You can see this "first complete Bible in the English language" amongst the manuscripts of the Bible in the British Museum, and you will notice that it belonged to Thomas, the youngest son of Edward III. He was the only one of all their children, says Froissart, who was present when Philippa died. Holding the king's hand in hers, she told him her last wishes, asking that "when it should please God to call you hence, you will not choose any other grave than mine, and that you will lie beside

me in the Abbey of Westminster." So there they lie, near the Confessor's shrine, Philippa's tomb opposite that of Eleanor, her husband's opposite that of Henry III. It is thought that the faces are portraits.

THE TROUBLED LAND IN WHICH A CHILD WAS KING

Round Edward's tomb were little gilt brass statues of his twelve children, but only six are left. From those of the Black Prince and Lionel Duke of Clarence we can gather the ordinary costume of gentlemen of that day. They wore long outside cloaks, and tight-fitting jackets with belts beneath. It was Lionel who was sent to Ireland to try to bring more of the country under English rule, but he met with but little success. English laws and customs were to be set up round about Dublin, in a district called the English Pale, but beyond that the Irish were to be left to themselves.

The son of the Black Prince, Richard II., followed his grandfather. He was only ten when he came to the throne, and an old poem describing the times quotes the words with sorrow, "Woe to the land when the king is a child."

The great nobles, especially the king's uncles, were always quarreling, and the peasants who worked on the land could bear their poverty and hardships no longer but at last broke into open revolt, marching to London, breaking into parks, burning and sacking houses. We have in the same poem a pitiful picture of the idleness of the nobles and clergy, and the sufferings and anger of the poor.

RICHARD, THE BOY KING, WHO PLACED HIMSELF AT THE HEAD OF THE MOB

Richard, when a boy of fifteen, showed great courage in meeting a mob of rioters, and placed himself at their head when the leader, Wat Tyler, was struck down. Springing to the front, he cried, "I will be your leader!" But the promises he gave were broken, and the poor folk were none the better off.

Richard did a great deal towards making Ireland more peaceful, but the improvement did not last. He made his own people very angry by trying to govern without Parliament, and at last, after many troubles, he was forced to resign his crown, as Edward II. had done before him. It was a sad ending to a brilliant beginning. When he was born, his father was a great and powerful

soldier and heir to the English throne, and the news of the boy's birth was received with shouts of joy from the soldiers assembled in the Great Hall of the Black Prince at Bordeaux. When Richard died, he had lost all his inheritance and was in prison alone. His tomb in Westminster Abbey is next to his grandfather's.

A distant cousin became king after him—Henry IV. As Henry IV. had no real right to the throne, he was constantly in dread of losing it, and found it very difficult to keep order in England and Wales. Scotland was afraid to do much against him, because their Prince James—afterwards James I.—was a prisoner in England.

When James was about nine years old his father sent him to France to be educated, and to be out of harm's way. His ship fell into the hands of Henry IV., who said, "His father should have sent him to me. I can teach him French as well as the King of France."

PRINCE HAL, WHO STRUCK A JUDGE AND WON A GREAT BATTLE AT AGINCOURT

All the years that the lad spent in England he used for study. He was particularly fond of Chaucer, and later wrote very interesting poetry himself. Henry IV. little thought that James, before he returned to his own land and kingdom, would act as chief mourner at the funeral of his own son, Henry V.

Full of life and mischief was Prince Hal, as he was often called in his father's lifetime, and he got into many scrapes, one of which ended it is said in his being sent to prison for striking a judge. As soon as he became king, his great ambition showed itself: he wanted to be King of France as well as of England. He had no real right to be so, but gathered a large force and crossed the Channel, and in the face of great difficulties won a victory at Agincourt.

One of the old chronicles tells all about it: "Of the trumpets rending the air with tremendous clamour; of the fury of war and deadly spear-thrusts and eager sword-strokes; of the wedges of archers and their piercing arrows; of how that brilliant star of kings, the light and lamp of knighthood (Henry V.), exposed that precious treasure of his person to all the chances of war."

After all this, and more, it was arranged

that Henry should marry Katherine, the French princess, and that when the poor, mad old king—her father—died, his son should be passed over, and Henry was to reign with Katherine. Things were in a bad way in France, where there were endless quarrelings among the nobles, and no one to keep them in order, or this arrangement could never have been made.

HOW HENRY DIED AND A BABY KING WAS CROWNED WITH A BRACELET

But all Henry's plans came to a sudden end. He was a good soldier, was wise, and seemed born to do great things; but he died when only thirty-five, leaving a little son of nine months as his heir. There is a picture of this child, crowned and wearing a long mantle embroidered with the arms of England and France. He was crowned on his mother's lap, with her bracelet, it is said, as a crown for his baby head.

Henry died near Paris, a long way from the coast, and the funeral procession went by Rouen at a slow pace in great state, Katherine, a widow at twenty-one, following behind in deep grief.

Then, taking ship, the crossing was made, and the procession formed again, passing along in the same order till Westminster Abbey was reached at last. The poet-king, James I., of Scotland, followed close to the coffin, and Henry's war-horses walked right up the nave, bearing the armor and helmet of the dead hero.

THE BRAVE GIRL WITH A WHITE BANNER WHO WAS BURNED TO DEATH

Henry VI. had a long reign. First his uncles governed for him, and during this time the English lost what hold they had on France. This was chiefly through the efforts of a young French girl, called Joan of Arc, who was bitterly sorry for the miseries of her country, and longed to drive the English out, and to see her own king upon his throne. So she dressed herself in shining armor, and rode at the head of an army, with a great white banner, cheering on the soldiers and making them brave like herself. At last she succeeded in leading them to victory. She was afterwards betrayed into the hands of the English, who cruelly burnt her to death.

THE MORNING OF THE BATTLE OF AGINCOURT



King Henry V. was ambitious, and wanted to be King of France as well as of England. He had no real right to rule in France; but he gathered a large force and crossed the Channel. Though opposed by the French army, he won a great victory at Agincourt, after one of the most famous battles in the history of England. In this picture we see the troops gathered round a priest, who is giving them his blessing.



The Wars of the Roses were one long struggle between the princely Houses of York and Lancaster, both struggling for the crown of England. One day, in the Temple Gardens, in London, the heads of the rival Houses met. The Duke of York plucked a white rose, calling upon his followers to do the same. The Duke of Lancaster, boldly fronting him, plucked a red rose; and so the Wars of the Roses got their name.

THE WARS THAT BEGAN IN A ROSE GARDEN

All the efforts made to regain France were useless, though the struggle lasted many years. One great misery these wars brought to England was that through them men became trained to be cruel and idle, and to think nothing of taking other people's goods. So, when troubles broke out in England between the nobles, these men were only too ready to join one side or the other, and turn against their own countrymen.

It makes one's heart ache to read of the times of the Wars of the Roses, which now began, and lasted for thirty years. The eleven battles which took place during this time were fought between the king and the nobles, up and down the country—near London, on the line of the old Roman wall, in the beautiful dales of Yorkshire; and all brought bitter woe and suffering to the whole country. These wars were called the Wars of the Roses because those on the side of Henry VI. and the Family of Lancaster chose a red rose for their badge, and those who were for the House of York chose a white one.

THE END OF THE GREAT WAR FOR THE CROWN OF ENGLAND

In the end, nearly all the great nobles who had begun the war were killed, either in battle or by execution, as first one side and then the other gained the upper hand. At last Henry VI. died miserably in the Tower. The poor man was often out of his mind for many years after Edward IV., of the House of York, first became king.

Henry was too weak to control others and to govern in such troubled times, but he was fond of scholars and teachers and books and pictures of all kinds. He founded the great school at Eton, and King's College, at Cambridge. His wife, Margaret of Anjou, did her best to help him to keep the kingdom, so that their son might have it after him; but the poor lad was killed, and the queen, after being in prison for some time, had to escape from the country and flee to France.

The wife of Edward IV. had many sorrows, too. At one time her husband had to leave England in great haste to avoid being taken by the Red Rose party, and she and her daughters had

to leave the Tower, where they were living, and go to a safe refuge at Westminster. Here her eldest son was born.

CAXTON, THE MAN WHO LEARNED TO MAKE A BOOK IN A FEW DAYS

About that time, close by the west door of the Abbey, there sat a man earning his living, busy from morning till night. He had learned, while young in Flanders, how to reproduce books in an easier and quicker way than the old way of copying by hand; in fact, how to begin and finish a book in a few days. He brought a printing-press back to England, and, setting it up in Westminster, printed many books.

You can see his early efforts in the long King's Library in the British Museum. The thick black letters are hard to read, and it is difficult for us who have more books than we can read to understand the intense interest and pleasure with which Caxton's work was greeted. The king and his family came to watch; the nobles turned over the sheets that poured from his press, to the delight of those who could afford to buy them.

When Edward IV. died, his son of thirteen was the next king, but the boy was never crowned, being hurried off to the Tower by his uncle Richard, who soon managed to get his little brother into his power, too. They both disappeared—it is believed that Richard had them killed in the Tower.

HOW THE KING SHOCKED THE PEOPLE AND UNITED THE NOBLES

He now became king himself, as Richard III., and tried to please the people by calling Parliament together and setting many things in order. He also did a good deal for trade and to make it easy for people to produce books. But many were so horrified at the death of the little princes that they turned against Richard, and in the battle of Bosworth Field, which followed, Richard was killed, and Henry Tudor, of the Family of Lancaster, was made king, as Henry VII.

He married the eldest daughter of Edward IV., and so the two Houses of York and Lancaster were united at last, the red and white roses mingling in one double flower, the Tudor rose.

THE NEXT STORY OF ENGLAND IS ON PAGE 855.

THE ROBBER WHO SAVED A QUEEN



After the battle of Hedgeley Moor, Queen Margaret, the wife of Henry VI., fled with her son into a forest, where she tried to hide. But she was set upon by robbers. While the robbers were quarreling over her jewels, however, the queen and her boy managed to escape, and, wandering in the forest, they met another robber. He was a brave man, and proved a friend to the sorrowful queen, who gave him charge of the young prince. The robber helped to conceal the queen, and eventually aided her to escape across the sea.

LINCOLN'S GETTYSBURG ADDRESS

Soon after the battle of Gettysburg, the field was dedicated as a national cemetery. On that occasion President Lincoln spoke the following words, which will endure forever as an expression of the spirit of the United States.

Four score and seven years ago our fathers brought forth on this continent, a new nation, conceived in Liberty, and dedicated to the proposition that all men are created equal.

Now we are engaged in a great civil war; testing whether that nation, or any nation so conceived and so dedicated, can long endure. We are met on a great battle-field of that war. We have come to dedicate a portion of that field, as a final resting-place for those who here gave their lives that that nation might live. It is altogether fitting and proper that we should do this.

But, in a larger sense, we can not dedicate — we can not consecrate — we can not hallow — this ground. The brave men, living and dead, who struggled here have consecrated it, far above our poor power to add or detract. The world will little note, nor long remember what we say here, but it can never forget what they did here. It is for us the living, rather, to be dedicated here to the unfinished work which they who fought here have thus far so nobly advanced. It is rather for us to be here dedicated to the great task remaining before us — that from these honored dead we take increased devotion to that cause for which they gave the last full measure of devotion — that we here highly resolve that these dead shall not have died in vain — that this nation, under God, shall have a new birth of freedom — and that government of the people, by the people, for the people, shall not perish from the earth.

The Book of THE UNITED STATES



FIVE FAMOUS PRESIDENTS OF THE UNITED STATES

TWENTY-SEVEN men have served as President of the United States since our government began in 1789. They were born in different parts of the country, and their early lives were also different. Some were poor boys, who had hard work to gain knowledge; others were the sons of rich men, who gave them every advantage of school, college and travel. Some were soldiers in their early life, while others served their country in civil offices. All of them tried to do what they thought was best for the country, though some succeeded better than others.

You will find something about every one of them in different places in our book, but here we shall tell you more fully of five of them. Every one of the five had great influence upon public affairs, and should always be remembered by patriotic young Americans.

GEOERGE WASHINGTON, THE FATHER OF HIS COUNTRY

On February 22, 1732, in a simple Virginia homestead in Westmoreland County, Virginia, a baby boy was born who was to alter the whole history of a nation. The name of that boy was George Washington. His father died when the boy was eleven

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years of age, and he spent much of his time at the home of his older brother, Lawrence. Good schools were not common then, and the future president did not attend at all after he was fifteen. His brother

Lawrence, who was fourteen years his senior, had seen fighting abroad, and had great influence upon his younger brother, whom he dearly loved, and to whom he gave his estate, Mount Vernon, by his will. There is a story that Lawrence secured for his brother a commission in the British navy, but that his mother's tears prevented him from accepting. We know that he visited the West Indies with his brother, who sought health there in vain.

When he was but sixteen, the real work of Washington's life began. He was placed in charge of the survey of the estate of Lord Fairfax in the Shenandoah Valley. With but one companion, another young lad by the name of George Fairfax, he started out on horseback to ride to Shenandoah Valley, a distance of one hundred miles through the forest. Upon their return to Mount Vernon, Lord Fairfax was so much pleased with Washington's work that he had him appointed a public surveyor. For the

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next few years the young man's life was an exposed, yet a healthful one, spent largely among the Indians in the forests. He was gaining self-reliance and a knowledge of the country that was to stand him in good stead in the days to come.

There soon came to Washington an opportunity to prove his pluck and perseverance. For years there had been a dispute between the French and the English as to the rights of each nation to occupy the Ohio Valley. The French were invading the country that the English claimed belonged to them. It was decided to send a trusty messenger from Governor Dinwiddie, of Virginia, to the French commander to remonstrate with him for building forts upon English land. All eyes turned to young Washington, who was making a name for himself throughout the country. He eagerly accepted the task. A journey of one thousand miles through a trackless wilderness in the dead of winter was an undertaking to cool the ardor of the most courageous; but Washington with a little party boldly plunged on through dark forests, over steep snow-bound mountains and swollen rivers, until the end of his journey was reached.

The French were very polite, but showed that they intended to stay where they were, and the little party turned homeward. The horses soon became too weak to stand, and leaving them behind, Washington pushed on ahead with a single companion—their packs strapped to their backs, and their guns in their hands. Upon reaching the Alleghany River, which they had expected to cross on the ice, they found to their dismay that it was broken up and filled with whirling, grinding blocks of ice. With one hatchet between them, Washington and his companion managed to build a rough raft. Desperately they struggled with the swirling current and the floating ice cakes. As they reached the middle of the stream, the raft suddenly heaved and Washington was hurled into the icy water. Instinctively he clutched a log, and by the greatest effort managed to reach a near-by island. Here the travelers tramped back and forth through the long darkness of night, their clothes stiffening to ice as the bitter wind searched them out.

When morning came they crossed to the other shore, and from there they

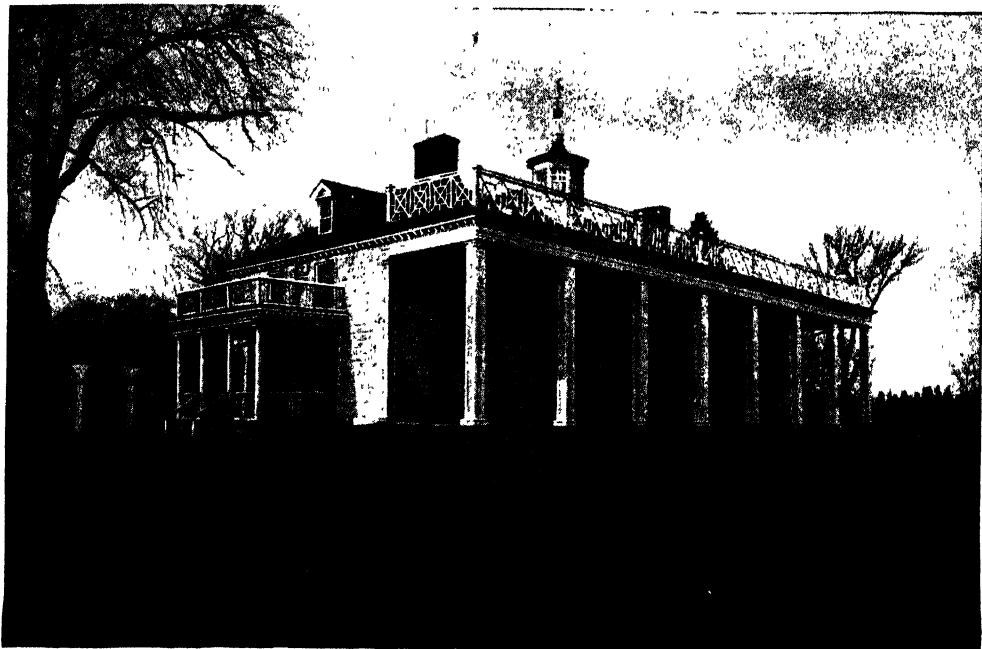
hurried on to Williamsburg, then the capital of Virginia, to deliver to Governor Dinwiddie the letter from the French commander. This courage was characteristic of Washington's whole life. He never flinched when there was a hard task to be done. In the French and Indian War that followed, he served bravely and well until the end of 1758. The war in the South and West was over then, and his resignation was accepted. In 1759, he married an attractive young widow, Martha Custis, to whom he had lost his heart upon first sight. Years of married happiness were passed on his broad lands at Mount Vernon before the country again called Washington to the front.

After the French and Indian War, the disputes with Great Britain, of which you may read in another place, grew more bitter. After the battle of Lexington, Congress determined that an army must be organized to defend the rights of the colonists. A leader was necessary. With one impulse the people turned to the man who had never failed his country or his friends in time of need. On June 5, 1775, Washington was unanimously elected commander-in-chief. On July 3d, amid the shouting of the multitude and the roar of artillery, Washington took command of the men, who had gathered around Boston.

These men had come from their farms at the news of trouble; they were without uniforms or camp equipment; their arms were their own rifles, and bullets which fitted the weapon of one man could not be used in that of his neighbor. They had not enlisted in an army; they had come to defend their country. It was Washington's task to make an army of this gathering and then to lead it in the battles which were to come.

It has never been known,—it can never be realized what that great man bore in the terrible years of privation and battle that followed. The soldiers he commanded were brave and patriotic, but they were not disciplined. Yet, they had to meet the deadly fire of the king's regulars, and it sorely tried their general's heart to see how dearly they must pay for their lack of experience and training as an army. Ammunition and firearms were scarce; food and clothing were almost unobtainable. During that win-

VIRGINIA HOMES OF TWO PRESIDENTS



Here is a picture of Mount Vernon, the home of George Washington. It was here that young George spent most of his boyhood days, and when he grew to be a man, it was here that he brought his young bride. At the close of his two terms as President, Washington returned to Mount Vernon to spend the remainder of his days. The house and grounds are preserved as a memorial to their great owner.



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Monticello was the home of Thomas Jefferson, the third President. Jefferson kept open house in the manner of a Virginia country gentleman. He was almost ruined by entertaining so much, and got very deeply into debt. Congress bought his library for the nation, and his friends raised enough money to help him out of his difficulty, but he did not live long afterward to enjoy his financial relief.

ter of horrors at Valley Forge, many of the soldiers went about their duties barefoot, leaving blood tracks behind them in the whiteness of the snow. The piteous, uncomplaining courage of these poor fellows wrung tears from the man who had said of the battle roar, "I heard the bullets whistle, and, believe me, there is something charming in the sound."

The American army, under its brave commander, spurred itself to remarkable deeds of endurance. Battle fields, where defeat seemed inevitable, were turned to victories under the generalship of this leader of men,—until the war that had started out so hopelessly for the American colonists ended in the surrender of Cornwallis and the whole British army of over 7,000 soldiers. Soon America was free.

On December 28, 1783, Washington offered his resignation and retired once more to his home at Mount Vernon, but he was not to be allowed to remain in peaceful obscurity. When the Constitution was adopted, a president was necessary. There was but one man who could fill the place. On April 30, 1789, Washington's inauguration took place. For eight years, two terms of office, he successfully guided the nation in ways of prosperity and peace; and then, refusing a third term, he again retired to his old home at Mount Vernon to enjoy the rest he so well deserved. One day when Washington had returned from a long ride around his plantation, he complained of a sore throat. The next day, December 14, 1799, the great man lay dying, his household gathered around his bed. The doctors were doing all in their power to prolong his life. With his usual dignified courtesy, he addressed them. "I feel I am going," he said, quietly. "I thank you for your attentions, but I pray you to take no more trouble about me."

Washington was not the greatest general who ever lived. Those of us who admire him most do not say that. He was more than a great general. He was a great man. He was a good soldier, a wise ruler, a true friend, and an honest, unselfish man. He loved his country, and was willing to make any sacrifice for it.

THOMAS JEFFERSON, AUTHOR OF THE DECLARATION OF INDEPENDENCE

Although no man could ever take Washington's place in the hearts of the

people, the third President of the United States, Thomas Jefferson, had many warm friends and supporters, though he had more enemies than Washington. Born in 1743 near Charlottesville, Virginia, he received very little schooling as a boy, and became, like Washington, a surveyor, enduring the hardships of the pioneer life. He was so fond of books and learning that he prepared himself for college. Bashful, yet warm-hearted and eager for information, it was not surprising that Jefferson made many friends for himself in the College of William and Mary, at Williamsburg, Virginia. This college, as you may know, is next to Harvard in age.

He studied law and began to practise, but his chief interest was in farming. From his father he had a large tract of land, and he bought more. In 1772 he married Martha Skelton, a charming young widow, who also had a great deal of land. All his life he was trying experiments in farming. He introduced better machinery, invented a plough, and brought many kinds of trees and plants from different countries to find if they would grow in the United States.

He was not to be allowed to remain on his plantations. Virginia and the nation had need of him. He served in the Virginia legislature, in the Continental Congress, where he wrote the Declaration of Independence, and as governor of Virginia. After the Revolution he served in Congress and from 1784 to 1789 represented the country in France. After his return, he was appointed secretary of state by President Washington, but resigned in 1793. One of the reasons was private business, and another the fact that he and Alexander Hamilton, also a member of Washington's Cabinet, could not agree.

He was a candidate for president when Washington refused to accept a third term, but John Adams, of Massachusetts, was elected. It was the law then that the man who received next to the highest vote should become vice-president, and so Jefferson held that office for four years. In 1801, he became president, and served two terms. He might have been elected again, but, like Washington, refused the honor.

He was much opposed to show of any kind, and went to the Capitol very quietly, when the time for the inauguration came. There is a story that he rode

alone on horseback, hitched his horse to the fence, and entered the building. Others say that some friends came to the house where he was stopping, and that together they walked to the Capitol. With Jefferson's administration there began an era of "republican simplicity." He believed in plain clothes, in simple food and simple manners. On the fourth of July and the first of January he threw the White House open to the public, but he declined to hold the weekly levees that had formerly been the custom. As a leader he was most lenient and just. One interesting incident is told of him that well points out the character of the man. While riding he met a stranger who bitterly railed against the President.

"Do you know Mr. Jefferson personally?" he was mildly asked.

"No, nor do I wish to," the man replied, violently.

"But is it fair to repeat such stories about a man and condemn one whom you do not dare to face?"

"I shall never shrink from meeting him if he ever comes my way."

"Will you then go to his house tomorrow and let me introduce you to him, if I promise to meet you there?"

"Yes, I will."

The next day, to his unbounded astonishment, the stranger learned that he had been talking with the President himself. So struck was he by Jefferson's charming personality and fairness of mind that he became the President's firm friend and supporter ever afterwards.

True politeness, springing from a warm heart, ruled all of Jefferson's words and actions. One day he and his grandson were out riding together. A passing negro bowed to them. The young man did not notice the salutation, but Jefferson courteously returned the bow. "Would you permit a negro to be more of a gentleman than yourself?" he sternly asked his grandson.

For the seventeen years following his retirement from office, Jefferson lived at his home, Monticello, which became a resort for all the great and noble minds in the country. But keeping open house to all who came ruined Jefferson financially. To his great grief he was forced to sell his library, which he had been collecting for over fifty years. The money thus obtained was but a temporary relief. Some friends heard of his difficulties and raised

the sum of \$18,000. Jefferson was greatly touched by this proof of the loyalty and affection of his countrymen, but he did not live long to enjoy the relief thus given him. He was now, as he said, "like an old watch, with a pinion worn out here and a wheel there, until it can go no longer."

Few men of his time were interested in so many things. He loved mathematics, music, and botany, knew several languages, and was a skilful architect. He was a fine shot, and a good rider. More than all else he believed in the people, and felt that all should be treated with courtesy.

On July 4, 1826, after a short sickness, he went quietly to sleep and so drifted into death. On Thomas Jefferson's tombstone are engraved these words:—

Here was buried

Thomas Jefferson

Author of the Declaration of Independence

Of the Statutes of Virginia for Religious Freedom

And Father of the University of Virginia.

Putting aside the winning personality and loveliness of the man, there are two things alone that would give Thomas Jefferson his niche in American history. He was the "Pen of the Revolution" and wrote for us the Declaration of Independence; and it was during his administration as president, largely owing to his influence, that the purchase of Louisiana was successfully accomplished.

ANDREW JACKSON, WHO ALWAYS DID HIS BEST

Andrew Jackson was the son of Irish parents who had emigrated to America. He was born on the 15th of March, 1767, shortly after the death of his father. A scene taken from his early boyhood gives the keynote of the life of the child who was to become General Andrew Jackson,—the seventh President of our young Republic.

He stood in the midst of a group of older boys, his fists doubled, his blue eyes blazing. "Don't dare to touch my things!" he said hotly. The older lads stepped back amazed at the sandy haired little fury that confronted them. "If you ask me for my things," the child went on, "you may have them, but you *shall* not touch them without my leave."

"Touchy," sniffed the others, disgustedly, but they left the little fellow's playthings severely alone after that lesson. "I could throw him three times out of four, but he would never stay thrown," one of the "boys" said of him long afterwards. "He was dead game even then, and never *would* give up."

Times became more and more troubled all over the country, and presently Andrew, and his older brother Robert, joined the army as scouts. Not very long after they were taken prisoners by the British. It is said that one of the British officers commanded the lads to clean his boots. They both refused. "Sir," said Andrew, proudly speaking for them both, "I am a prisoner of war, and demand to be treated as such." "I never heard such insolence," fumed the British officer. "Black those boots instantly!" "I am not a servant to any Briton that breathes," he returned, coldly. Thoroughly infuriated the British officer rushed upon the boy, and struck at him. Instinctively Andrew raised his arm, and the blow aimed at his head is said to have broken his arm. His hand bore the scar to the end of his life. Shortly after Andrew's mother secured the release of her two sons; but Robert died in her arms two days later of smallpox contracted in the British camps. Andrew also was attacked by that dreaded disease, but after a long and dangerous illness was finally saved. His brave little mother died herself soon after from ship fever caught while tending the sick upon the Charleston prison vessels.

Andrew was now an orphan at the age of sixteen, alone and penniless in the big world,—but the boy was a fighter born. No circumstances, however sad and hard, could vanquish his brave spirit. He found a home in the family of a distant relative, where for a while he worked as a saddler; then for a short time he taught school. Finally he began to study law at Salisbury under Mr. Spruce McKay, a well known lawyer of that time. Many years later, speaking of this time of his life, he said, "I was but a raw lad then, but I did my best." That was the secret of his success. Always he did his best.

When twenty-one he was appointed public prosecutor of the Western District of North Carolina, later to become the state of Tennessee. Soon he began to be widely known throughout the country as

a rising man, and when he was twenty-nine years of age, he was selected by Tennessee to be one of her representatives in Congress.

In the meantime he met in Nashville the little dark-eyed woman, Rachel Roberts, who was to become his wife. It is said that history does not record a happier marriage. To the world he was overbearing and harsh, and was often profane; but with her he was patient, gentle, and courteous, and when he won renown, she was happy for his sake.

In the autumn of 1797 Jackson was chosen United States Senator, but a year later he resigned his office. He was too prominent a man to be allowed to remain a private citizen, and was elected to the Supreme Court of Tennessee not long after. Six years later he resigned this post because of private business, and became major-general of the state militia. As there was no war in progress, he continued to practise law and also opened business as an Indian trader. So great was his reputation for honesty that once when a citizen of Tennessee requested a loan from some Boston bankers, backed by a paper signed with two prominent names, they asked "Do you know General Jackson? Could you get his endorsement?"

"Yes, but he is not worth one tenth as much as either of these men whose names I offer you," objected the man.

"No matter," returned the bank officers, "General Jackson has always protected himself and his paper, and we will let you have the money on the strength of his name."

But honest and lovable as Andrew Jackson was, his fiery temper led him into many rash acts that hurt his career. At one time, indignant at a supposed insult, he challenged a prominent man by the name of Charles Dickinson to a duel, and shot him dead. In this contest he received a wound which troubled him till his death. He fought other duels, and was again wounded. His violent temper made him many enemies, though duels were very common in those days. But withal he was very tender in his dealing with the young and weak. The following story is told by the Hon. Thomas H. Benton in his "Thirty Years' View."

"I arrived at his house one wet, chilly evening in February, and came upon him in the twilight, sitting alone before the

fire, a lamb and a child between his knees. He started a little, called a servant to remove the two innocents to another room, and explained to me how it was. The child had cried because the lamb was out in the cold and begged him to bring it in, which he had done to please the child, his adopted son, then not two years old. The ferocious man does not do that, and though Jackson had his passions, they were for men and enemies—those who stood up against him—and not for women and children, nor the weak or helpless; for all of whom his feelings were those of protection and support.”

Truly this man was a strange combination of harshness and tenderness. To a woman or a child he was always soft and gentle. In his eyes his friends could do no wrong, but he was bitter toward his enemies. While an act of injustice made him angry, he was sometimes unjust and unkind toward those who had injured him or his friends. He always did what he thought was right.

It was during the Creek Indian War that Jackson won for himself the term of “Old Hickory,” which grew to be a name of endearment among his soldiers, for they would proudly tell each other that the general was “tough as hickory,” and could be depended upon just as surely. Later Jackson served in the War of 1812, gaining for himself much renown and an undying name for fairness to his foes and bravery in battle.

In 1824 Andrew Jackson was among the candidates for the presidency, but, owing to the enemies won by his hasty temper, he was defeated in favor of John Quincy Adams. On December 23d, Rachel, his beloved wife, died, leaving her husband utterly stunned and broken-hearted over his loss. For years he was inconsolable, and until the end of his life he wore her picture upon a chain about his neck. There was no other woman in the world for him. When he came to the presidency in 1829 he provided the White House with no mistress, and during his eight years of residence there the gentle face of his wife was the last thing upon which Jackson looked at night. It was the first thing upon which his eyes rested in the morning.

Jackson served two terms as President, and upon his retirement from office he returned to his home, The Hermitage, to spend the remainder of his days among

his own people. “The people of Nashville met him with outstretched arms and tearful faces. He was seventy years old, *their* President, and he had come home to live and die with them.” Eight years later, on Sunday, June 8, 1845, the family and servants gathered in the sick room of Andrew Jackson. They were weeping bitterly; but peace was written in the face upon the pillow. The spirit of the fiery, great-hearted man was at rest. He was going—home—to *her*.

A ABRAHAM LINCOLN, WHO SAVED THE UNION

He first saw the light February 12, 1809, in a little log cabin in Kentucky. The cabin was a ramshackle affair, the clearing in which it was built was rank with weeds; the acre or so of corn that stretched away to the woods was choked with high grasses and creeping vines. Shiftlessness was written in big letters over the unkempt garden and on every sagging log in the cabin walls. Abraham's father was a carpenter, but he neglected his trade to spend his time wandering about the woods, his gun in his hands, his dog at his heels. To Mrs. Lincoln was left almost the entire care of the little clearing, and to the wonderful energy and brave cheerfulness of this woman, Lincoln owed the incentive of his life. “God bless my mother,” he said in later years. “All that I am or ever hope to be, I owe to her.”

When a log school house was opened in the neighborhood, it was Mrs. Lincoln who wished to send her children to learn the alphabet and master the spelling book. Mr. Lincoln grumbled, but the mother had her way. Her little son and daughter attended the school so long as it was open. Often she gathered the children at her knees. “You must learn to read and write,” she said wistfully, a gaunt, toil-worn hand upon each upturned little head. “You must get knowledge, so that when you grow up you will be wise and good.”

Lincoln's father was of a wandering disposition, and when Abraham, or Abe, as the boy was called, was seven years old, he moved his family to a farm in Indiana, then almost a wilderness. Here, in the late autumn, they selected the spot for their new farm, and father and mother and little son all set to work, with axes in their hands, to make a clearing in the woods for their new home.

Winter was almost upon them, and with more haste than care, they built themselves "a half-faced camp" of logs.

In the autumn of 1818 a strange sickness broke out all over the countryside, killing men and cattle by the dozens. Mrs. Lincoln was among the ones stricken. A week after she was taken ill, her husband and little son, with heavy hearts, built the rough pine coffin for the wife and mother, who had loved them so well and served them so faithfully. A winter of dismal loneliness descended upon the Lincoln family. The children missed her piteously. Often their father was away for long hunting trips, leaving them alone in the cabin in the wilderness. Night would find the two huddled together against the cabin wall, their arms about each other, their ears straining for the sound of footsteps that did not come, and hearing only the dismal howling of the wild animals that prowled about in the darkness.

It was a happy day for them, when their father brought home a new mother, with her son and two daughters. At first the Lincoln children hung back shyly from the newcomers. But the sweet motherly ways of the new Mrs. Lincoln soon won their hearts. She was a very capable woman. It was not long before she had the disorderly cabin spick and span. She brought with her some new furniture and a goodly array of bright pots and pans, and soon the place was fairly shining with a sweet wholesomeness and comfort it had never known before.

When Abraham was eleven years old a schoolhouse was built not very far from their home, and the question again arose whether the boy should be allowed to attend. His father contended that a big, able-bodied boy like Abe was of more use on their little farm than he could ever be at school; but his new mother said, "No, the boy must be given an education." Abraham went to school and this was the beginning of his love for books. The boy's school life was irregular, for he was much needed on the farm. In all he attended school hardly more than a year, but he never let an opportunity slip to read everything on which he could lay his hands. Many weary miles Abraham traveled to borrow books. After his day's work was ended he would read as long as it was light, then, lying on the floor in front of the

fireplace, with the aid of the glowing coals, he would read on into the night, often writing his compositions on a wooden shovel with a piece of charcoal. When the surface was covered he was sometimes obliged to shave off the first part of his work to make room for the last.

At nineteen, Lincoln made a trip in a flatboat, down the Mississippi River to New Orleans. It was not long after this, that the Lincoln family once more started on the trail. This time they moved to Illinois. There young Lincoln helped to build the log cabin, and to split rails to fence the fields. After another trip to New Orleans, he took a position as clerk in charge of a store in New Salem. When the Black Hawk War opened in 1832, he was elected captain of a company, but saw no hostile Indians. He then bought a little store, but was not successful, and did some land-surveying. Lincoln's public career began at the close of the war, when, for a time, he served as postmaster in New Salem.

About this time he "was a tall, gawky looking fellow, wearing a wide-brimmed straw hat without a band, a homespun shirt and claw-hammer coat, and tow trousers that did not meet his shoes by several inches." Strangers felt when they looked at him, "This man is a clown." The moment he opened his mouth to speak, all consciousness of his uncouth appearance vanished from their minds. Here was a man who dealt with souls. The people had so much confidence in him that they elected him to the legislature in 1834, and he was re-elected three times. Meanwhile he studied law, and was admitted to practice in 1836. In 1846 he was elected to Congress, and served one term.

For several years after his return from Washington he devoted himself entirely to the practice of law; but, in 1854, when the entire country was roused over the Kansas-Nebraska Bill regarding the admission of slave states to the Union, Lincoln again came to the front and took an active part in public affairs. He protested that "slavery is founded on both injustice and bad policy." Then followed the famous debates between Lincoln and Stephen A. Douglas, the "Little Giant" of Western politics. Both were candidates for the United States Senate, in 1858, and

the debates caused much excitement. Douglas was elected, but Lincoln had gained a great reputation.

In 1860 Lincoln was nominated for the presidency by the Republican party, and was elected in November. Upon the news of his election the long expected division of the nation upon the slave question occurred. South Carolina soon seceded, and others followed until there were eleven states in the Confederacy. On the 11th of February, 1861, Lincoln spoke a few words of farewell to his own people, and with a sad heart turned toward the capital, "to assume a task more difficult than that which devolved upon Washington." The outlook was indeed gloomy.

In the beginning the new President did not have the support of all in the North. Many were opposed to keeping states in the Union by force, and others dreaded the rule of the new Republican party. Several leaders of the party were much better known than he, and some of them had expected to be named for the high office which had gone to the uncouth, uneducated Westerner. They could not understand a man who told funny stories in such a time, for they did not see that every one of his stories had a point which illustrated the matter in hand. These people thought that the country was in the care of a man who could not save it.

The Civil War opened with the firing upon Fort Sumter by the Confederates, and the years that followed were full of trial and terror to the nation. Steadfast amid the clamor of his foes Lincoln held to his purpose and policy to unite the North and South. But while the President toiled in the executive office, his heart was bleeding for his fellow countrymen who were falling by the thousand on the field of battle, sorrowing even as a father in the sorrows of his children. He had but one thought through all those dark years,—*the preservation of the Union*. "If I could save the Union without freeing any slave," he wrote a friend, "I would do it; and if I could save it by freeing all the slaves, I would do it; and if I could save it by freeing some and leaving others alone, I would do that. What I do about slavery and the colored race, I do because I believe it helps to save the Union: and what I forbear, I forbear because I do not believe it would help save the Union."

On the first day of January, 1863, President Lincoln issued the Emancipation Proclamation, freeing all the slaves in the Confederate States of America. In 1864 he was re-elected to the presidency, but the pressure of public affairs became so unbearable that it seemed as if this strong man were carrying more than he could endure in heart and mind. "I think I shall hardly live out this term of the Presidency, the burden is so great," he said. Yet there was nothing of weakness about Abraham Lincoln. He faced each problem squarely as it came.

With the sure hand of a leader of men he guided the nation into peace at last. General Lee surrendered at Appomattox, April 9, 1865. It was certain that there would be little more fighting. The President's purpose was accomplished, the Union was saved. The country went wild with joy. Bells were rung; and the people shouted the good news to each other, laughing as they told it; while prayers of thanksgiving were offered up in the churches all over the land.

In the midst of rejoicing there came a great shock. While attending the theatre, in Washington, April 14, 1865, the President was shot in the head by an actor, John Wilkes Booth. The assassin entered his box, shot his victim, and sprang to the stage below. He fell and broke his leg, but managed to reach his horse, which he had left at the door, and galloped away. But for his accident he might have escaped. As it was he was able to conceal himself from the thousands searching for him for twelve days. Finally he was trapped in a barn, and shot when he refused to surrender.

It was only when the first fury for revenge was over that the people came to the real bitterness of their loss. "This was a Man," they said, and choked as they said it. Of Abraham Lincoln, Robert Ingersoll wrote:—"It is the glory of Lincoln that, having almost absolute power, he never abused it, except on the side of mercy. Wealth could not purchase, power could not awe, this divine, this loving man. He knew no fear except the fear of doing wrong. Hating slavery, pitying the master—seeking to conquer, not persons, but prejudices—he was the embodiment of self-denial, the courage, the hope and the nobility of a nation. He raised his hands, not to strike, but in benediction. . . . Lincoln

colors are as fresh and rich and lovely now as they were then.

So much was he admired at the Court of the Emperor Charles V. that the noblemen were jealous of him. "Ah," said the emperor, "I have many nobles, but only one Titian!" One day the artist, when talking to the emperor, dropped his pencil, and the emperor, who was one of the proudest men in Europe, stooped and picked it up, saying that it was an honor to serve so great an artist.

TITIAN'S PICTURE, THE GREATEST TREASURE AT THE COURT OF SPAIN

A terrible fire broke out in the palace of the King of Spain, and when the king was told of it he asked if they had saved Titian's great picture of Venus, which had been hanging in the palace. They answered that they had saved it. "Then I can bear all my other losses," the king said.

The only man whose fame is as great as Titian's is Raphael, who was born in Italy in 1483, and was alive at the same time as Titian. As a boy Raphael studied under a great painter, but he was soon able to paint so much like his master that now, when we see pictures done by both of them, it is hard to say which is Raphael's and which is by Raphael's master.

The boy was really a greater painter than the man who taught him. Raphael studied all the great painters who had lived before him and copied all their best ideas. He put all these ideas into his own work, and, though he did not think out new subjects for pictures, he painted pictures that seem almost perfect.

The great and beautiful home of the Pope in Rome is called the Vatican, and Raphael did many of the wonderful paintings there. He was an architect, too, and drew the plans from which St. Peter's at Rome, the grandest church in the world, was altered.

RAPHAEL, WHOSE WONDERFUL PICTURES WERE THROWN AWAY

While Raphael was working for the Pope he made some drawings called cartoons, from which famous weavers were to make tapestries, or wall carpets, to hang upon the walls of a chapel. When the tapestries were made, they were so wonderful that people looking at them thought they were paintings.

Years rolled away, and the King of England bought the cartoons. So fine did people think them that they actually built a factory and sent for many clever workmen to come and make the tapestries which Raphael had drawn. Then came another king who did not know how precious they were, and as nobody understood them they were treated as rubbish and lost. One day a clever man found them, and saw what they were, and they were then thought so much of that \$2,500 was spent in making the frames to put them in. Money could not buy these drawings now, but one may see them at the South Kensington Museum, London.

Many painters have come to be known by the name of the town in which they were born, or the place where they did their best work. This was so with the famous artist Correggio. His real name was Antonio Allegri, but he is known by the name of the town where he was born. Some of the best pictures in the world were done by him. One he did for the home of the monks at Correggio.

CORREGGIO, WITH THE SECRET OF LIGHT, AND RUBENS, WITH THE BIG BRUSH

Artists were not very well paid in those days, and Correggio was paid less than \$250 for a picture over the altar of the convent. One dark night thieves broke in and stole the picture. The people of the town were very sad when they heard of the loss, and two hundred people, rich men and poor men, went to the governor of the town and asked that the picture should be found and given back. But the governor could not get it back; so the people sent to the Pope and to everybody likely to help them. Still nothing could be done, and the picture, carried perhaps into some rich man's palace, was never heard of any more.

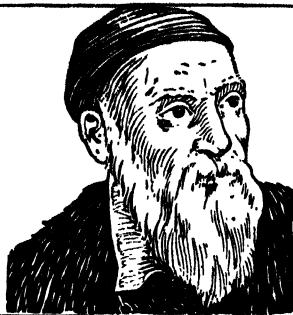
Correggio learned the great secret of how to show in a picture the effects of light. Rembrandt's pictures show this too, but Correggio's light is much softer and gentler than Rembrandt's.

Another great artist was Peter Paul Rubens, a Dutchman. His father, who was a very poor sort of person, died while he was a child, but his mother had him well educated. When he grew up he was so fine a gentleman that he could have made his fortune as an ambassador, had he not loved painting. His services as

TWELVE OF THE WORLD'S GREAT PAINTERS



Da Vinci painted in a life-like way. He makes us *feel* much more than we *see* in his pictures.



Titian was the best color painter who ever lived. His colors are wonderful and full of meaning.



Raphael copied the best ideas of other painters, and painted pictures that seem almost perfect.



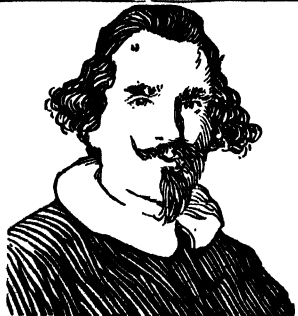
Van Dyke had more feeling than his great master, Rubens. His colors blend in beautiful harmony.



Rubens made a fine show by using a big color brush. He was content to make us *see* rather than *feel*.



Correggio knew how to show the effects of light. His light is softer than that of most other artists.



Velasquez was clever in making us see the chief things in his picture, in which he put nothing unnecessary.



Rembrandt painted a man as a man is—so that we feel he is natural, and part of everything around him.



Hogarth's pictures show the vulgar side of life. He had a wonderful way of showing real character.



Gainsborough's fine portraits of handsome people really help us to understand the life of his time.



Reynolds used color better than any other man then living. His portraits are bold and strong.

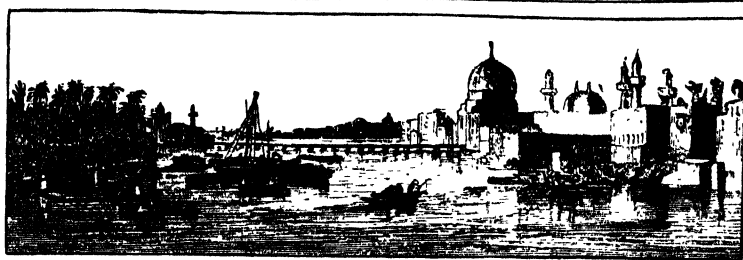


Turner stole the sunshine and put it in his pictures. No other artist ever painted sunlight so well as he.

THE GIGANTIC BIRD IN THE VALLEY OF DIAMONDS



When Sindbad's ship was returning from the Valley of Diamonds, he was pursued by a gigantic bird called the roc, whose egg one of the sailors had broken. The bird dropped a huge block of granite, which sank the ship. Sindbad escaped by swimming to an island near by, where he met with the Old Man of the Sea.



BAGDAD, THE CITY WHERE SINDBAD THE SAILOR LIVED

SINDBAD THE SAILOR

AS Sindbad the Sailor was sitting in the mansion which he had built in the city of Bagdad, he heard a poor porter in the street say :

"Men are not rewarded according to their merit. I have worked harder than Sindbad, and yet he lives in splendor and I live in misery."

Sindbad was moved by the porter's complaint, and invited him to come in and listen to the story of his adventures.

"Perhaps when you have learned by what sufferings I won my wealth," said Sindbad, "you will be more contented with your own lot in life."

"Look at my white hair and worn face! I seem an old man. But how young and strong I was when I sailed away to make my fortune by trading in strange countries! Soon after we departed our ship was becalmed near a small island, but when we landed to look at the place we found that what we had taken for land was only the green back of a great whale."

"No sooner had we landed than it began to sway to and fro, and then it plunged beneath the waves and left us struggling in the sea. Clinging to a large piece of wood, I was washed ashore on a desert island."

"Here I thought I should have starved. But on wandering about I found a clump of fruit-trees, and hidden among them a great white ball about fifty feet in size. By this time I was very weary, and so when I

CONTINUED FROM P. 726

had eaten some of the fruit I crept beneath the ball and lay down to sleep. Just as I was

closing my eyes I looked up, and saw that the sky was darkened by the wings of a gigantic bird.

"'Good heavens!' I exclaimed. 'This great white ball is the egg of that monstrous bird that sailors call a roc.'

"And so it was. The roc settled on the egg under which I was lying, and one of its claws, which was as big as the trunk of a tree, caught my dress."

"At daybreak the roc flew up into the air, and carried me to such a height that I could not see the earth. Then it descended with such speed that I nearly lost my senses. As it alighted I freed my dress, and found myself in a deep valley cut off from the world by a circle of high, steep mountains."

"It was the Valley of Diamonds! The ground was covered with precious stones. Full of joy, I began to fill my pockets with them, but my joy was soon turned to terror. The valley was haunted by great serpents, and I could find no means of escape."

"I crept into a cave and blocked up the opening with a large stone, but all night I was kept awake by the hissing of the serpents. At daybreak they retired, as they were afraid of the roc that used then to visit the valley in search of food. Then I stole out of the cave, only to be knocked over by something that came tumbling down the mountain-side. It was a great

piece of fresh meat. As it rolled along, the diamonds on the ground stuck to it. Looking up, I saw on the mountains a band of men, who were preparing to roll another piece of meat down into the valley.

"'I have heard of this means of getting diamonds,' I said to myself. 'It strikes me that it is also a good means of getting away.'

"So I tied myself to the piece of meat, and hid beneath it, and presently an eagle swooped down and seized the meat and carried it to its nest on the top of the mountains. The band of men drove the eagle away, and turned the meat over to pick off the diamonds that had stuck to it, and found me tied to it.

"When they had all the diamonds they needed, we sailed for home. But on passing the desert island my companions landed with an axe and broke open the great white ball. A terrible scream rang through the sky. The roc had seen them! They rushed back to the ship, and we quickly sailed away; but the roc followed us, bearing in its claws a great piece of granite. This it dropped on our ship, and down we all went into the sea. Holding on to a fragment of wreckage with one hand, and swimming with the other, I managed to reach another island.

"It was a delicious spot! Sparkling

streams ran between vineyards full of grapes and orchards full of fruit. There I met a strange old man, who made signs to me to carry him over one of the streams. As soon as I hoisted him on my back, the old man threw his legs over my neck and squeezed my throat so that I fainted. When I came to, he was still fixed on my shoulders. There he remained all day and all night, and when I awoke next morning there he was still. He never got off.

"He made me his slave. When, in order to keep up my strength, I made some wine out of the grapes, he took it from me and drank it all up. Happily, it was too strong for him, and, releasing his hold of my neck, he fell to the ground, and I killed him.

"By the shore I met some sailors, with whom I returned to Bagdad.

"'That was the Old Man of the Sea,' they said to me. 'You are the first person that has escaped from being at last strangled by him.'

"Now don't you think," said Sindbad to the porter, "that I have earned all the riches that I brought away from the Valley of Diamonds?"

The porter agreed that he had, and Sindbad then gave him a handsome present, and he went home more contented with his own lot in life.

HOW NAPOLEON CAME FROM ELBA

HE stood in front of his old veterans, a little bowed man in a grey riding-cloak, long boots, and a cocked hat, with his lips pressed against the splendid banner of France.

He was bidding farewell to his soldiers. The great Emperor, the man who had shaken the earth to its foundations, the man who had begun life as a poor lieutenant, and in a few years had excelled all the conquests of Caesar, Alexander, and Hannibal, and had seated himself upon a throne, and placed a crown upon his head—this man, the great Napoleon, was beaten at last, and was now going into exile, hated and scorned by the human race.

On his way to the coast where the ship waited to carry him far from France, he was cursed by the people. They ran beside his carriage and hurled stones at him. He had to put off his familiar clothes and don a disguise to escape murder. "Down with the tyrant!"

they cried. So he went away—the great Napoleon, the mighty Emperor—away from France, away to a little island named Elba, which had been thrown to him like a scornful toy by the kings of the earth who had conquered him at last.

Why had he fallen? They say his brilliant mind had become clouded. In the days of his victory he had been lean and quick, a little slim, fleshless man with flashing eyes, who rapped out words like shots from a gun. This was before he called himself Emperor. Now he was heavy, corpulent, slow of movement, slow of speech. The mind was failing. The great brain was giving way.

But at Elba that great brain flickered up once more like a spluttering candle, and the lurid glare of that dying flicker dazzled the world like a flash of lightning. It will sound to you like a fabulous story. You will think that no such man ever lived. You will forget that you are

HOW NAPOLEON CAME FROM ELBA

reading of one who died less than a hundred years ago.

This is the story. While Napoleon lived on the distant island of Elba, he heard that France was unhappy under its new King. He, who had been turned away and stoned out of France, no sooner heard this than he determined to return. His brain conceived the idea of winning back every fragment of his lost glory. Once again the eyes flashed, the words came quickly, the whole man quivered and thrilled with energy. This despised and beaten exile would go

these French ships came close, and, seeing that the vessel was from Elba, called out laughingly, "How is the little Emperor?"

"Marvelously well!" was Napoleon's answer, who had made all his soldiers hide.

Presently there came a calm, and the few scattered ships of the returning Emperor lay like logs upon the water. A single cannon-shot would have finished the adventure. Napoleon did not lose heart. He composed impassioned addresses to his old army in France, and

NAPOLEON'S TRIUMPH OVER HOSTILE TROOPS ON HIS WAY FROM ELBA TO PARIS



Napoleon was beaten at last. He who had held the world in terror was driven into exile on the island of Elba. But his brain flickered up once more, and he marched to Paris. At Grenoble he was stopped by a regiment of his old troops, pointing their guns against him. He walked up to them alone, and asked, "Where is the man who would shoot his Emperor?" The men dropped their guns and went with him to Paris. For 100 days he ruled again, and then, after his defeat at Waterloo, France threw him off for ever.

back, and be Emperor once more. He would conquer France. He would defy the world.

So, while all the nations thought that this mighty hero was brooding like a wounded eagle on the rocks of Elba, he and his few soldiers were stepping on board ship at night, and sailing in the direction of France. It seemed the adventure of a madman. The sea was crowded by the French King's ships and by the English ships—and all the world was against Napoleon. One of

every soldier on board who could write set about copying these patriotic appeals of the Emperor.

"I shall take Paris without a shot being fired," he cried gaily, and everyone felt the magic of his dauntless soul.

Here was a man whom only death could crush. He trusted to those words copied by the soldiers on shipboard to bring France to his feet. And while he was dictating the words he was surrounded by ships of war.

At last a favorable wind came, and

his little fleet arrived at its destination. Napoleon stepped upon French soil. The wounded eagle had returned. None of the big warships at sea guessed who had passed them in the tiny fleet.

NAPOLEON'S WONDROUS MARCH THROUGH THE MOUNTAINS OF FRANCE

Then began the wondrous march. With his handful of soldiers, on a bright moonlight night he set out on the long journey to Paris, a journey that ran near to the very towns whose people had hurled their stones at him but a few months ago, a journey through a mountainous country held by the soldiers of the new King, a journey which a body of police might easily have stopped, and a magistrate have ended by hanging Napoleon.

Was it not wonderful confidence and courage that held this beaten man upon his march? For he trusted to no weapons. He trusted to the magic of his name. He trusted to the fame and power of his soul.

Well, he set out with his soldiers, sending his proclamations before him, which called upon all those who loved France to rally to their Emperor. Soon he was joined by peasants who adored his name. It was like a visit from the tomb. People thronged to him, amazed at the sight they saw. Napoleon's poor soldiers, few of whom had horses, carried their saddles on their shoulders and their arms in their hands, and tramped thus burdened through the mountains, saying nothing but "Long live the Emperor!" As they approached the town of Gap, Napoleon spurred forward with only a few men, and boldly entered the city. He claimed the love of the people. Men and women flocked to him, kissed his hand, and vowed to die for him.

NAPOLEON WALKED TOWARDS SIX THOUSAND LOADED RIFLES, ALONE

He might have been a victorious conqueror instead of a poor exile hated by mankind. Here he rejoiced with the people a few hours, printed his proclamations, and hurried on again. The whole city appeared to follow in his train.

Then they came to the greater city of Grenoble. The general in command of the King's troops, with 6,000 armed

men, issued from the city to oppose Napoleon. All the peasants, who had heard of Napoleon's coming, crowded to see the sight.

And slowly through the dust of the mountains came Napoleon and his gallant handful. When he saw the 6,000 soldiers drawn up to dispute his path, he halted his people and went on with a few horsemen. A hundred paces from the line of bayonets, he dismounted and advanced alone.

The order rang out for the troops to fire. Every musket was at the shoulder. Not a bullet came.

Napoleon strode on, without a sign of fear, and, throwing open his cloak, asked, "Where is the man who would shoot his Emperor?" Then the muskets were lowered, and a great shout of "Emperor! Emperor!" went to the sky. He had conquered.

After that, we are told, the march of the exile was like "the spread of a mighty influence which nothing can resist." Regiment after regiment hastened to meet him, the lilies of the new King were torn down and trampled in the dust, and Napoleon's eagle was everywhere set up. City after city came out to meet him.

THE MAGIC NAME THAT BROUGHT THE NATION TO HIS FEET

"Your riding-whip will scatter all resistance," they told him. And sure enough, without a shot being fired, with his enemies and the new King and the new princes fleeing before him, this poor exile arrived in Paris, his eagle, as he said, having flown from steeple to steeple with the national flag, and lighted on the towers of Notre Dame, the great cathedral of Paris. The magic of his name had brought a whole nation to his feet. France had but one language: "Napoleon!"

So he returned. But this flash of genius was the last flicker of his mind, and in a hundred days he was once more trampled in the dust. Yet that bloodless march from Elba will live in history as one of the most marvelous triumphs of men in all the history of the world. One can almost see the war-scarred veterans kneeling in the dust at the feet of their returning Emperor, almost hear their sobs as they ask for his forgiveness.

THE RAID OF THE WITCHES

THE old witches who hide in lonely caves among the Grampian mountains in Scotland do not now disturb the people there as much as they used to. And Aleck Stewart knows why, though he does not care to tell everybody. Aleck is a young herdsman, and he is as sprightly and daring a lad as you will find in the Highlands. One cloudy summer night he was coming home across the mountains from a wedding feast, and as he passed by a cave he heard the sound of voices.

"What can anyone be doing here this time of night?" said Aleck to himself.

There was a tree growing by the cave, and Aleck hid behind it and listened. Suddenly a swarm of witches came out with broomsticks in their hands, and said:

"By yarrow and yew,
And my broomstick too,
Leap over to Lapland!"

And away they flew on their broomsticks up into the clouds. As the last old witch came out, Aleck thought to himself:

"I'll be in this and chance what falls."

And he snatched the broomstick from the witch, and got astride of it, and said:

"By yarrow and yew,
And my broomstick too,
Leap over to Lapland!"

In the twinkling of an eye he found himself rushing through the air with the witches, and one of them said:

"However did ye get up here, Aleck?"

But Aleck knew something about witchcraft. He knew that if he uttered a word he would fall off his broomstick

and break his neck. So he rode on in silence among the witches. They swiftly passed out of Scotland, and crossed the sea, and arrived at Norway. Then they swept northward and came to Lapland, and flew through the gate of a castle.

"Hey!" cried the man at the gate as the witches swirled by him unseen. "Hey! There's a wild wind blowing in to-night."

The swarm of witches carrying Aleck with them rushed down the corridors of the castle full against the closed door of a cellar. Aleck shut his eyes, expecting to be hurled against the cellar door. But somehow he whiffled through the keyhole, and when he recovered himself, there he was, in the cellar with the witches, and drinking wine as gaily as if it had been honestly come by.

"Now ye ken, Aleck," said the witches, "why we never trouble anybody in the Grampians when we need anything. There's always stuff as guid, ay, and better to be gat frae foreigners."

Aleck laughed so loudly that a servant opened the

cellar door to see who was within.

"By yarrow and yew,
And my broomstick too,
Skip over to Scotland!"

said the witches; and so said Aleck, getting on his broomstick. And he remembered no more till he found himself waking up outside the cave in the Grampians, just as the summer dawn was breaking. He looked into the cave. There was nobody there. At least, he could not see anybody.



In a twinkling Aleck found himself rushing along with the witches, riding broomsticks into the clouds.

THE UNHAPPY KING OF PERSIA

THERE was once a King of Persia who was very unhappy. He was a great conqueror, and he was very rich and famous; but he had no children, and this made him sorrowful. He built himself a glorious palace on a lonely island in the sea, and lived there.

But one day a merchant came to the palace and brought the King a very beautiful slave-woman. As soon as the King saw the slave-woman he fell in love with her, and married her in great joy. He arrayed her in costly dresses, and he gave her the best rooms in the palace, with all the windows overlooking the sea, and he appointed a hundred attendants to wait upon her. But, strange to say, the slave-woman never spoke to him. She never spoke to anyone. Day after day she sat by a window and gazed at the sea.

In this manner a year passed by, and then a charming little son was born to the King and Queen. The King went wild with delight when he knew that a son and heir had been born, and he threw himself at the feet of the slave-woman and said to her:

"Oh, my beloved Queen, why do you never speak to me? Nothing is wanting to complete my happiness except a single word from your lips."

The slave-woman smiled, and then at last she spoke.

"Ah, my King," she said, "how kindly and tenderly you have treated me since I was dragged as a slave to your palace! But think how a royal princess must feel when she has been sold as a slave!"

"What, you are a princess?" cried the King.

"I am the Rose of the Sea," said the Queen proudly, "and my brother, King Selah, rules over the richest kingdom in the depths of the ocean. Unhappily, we have quarreled. Last year our country was invaded and our palace destroyed, and, fearing that I might fall into the hands of the enemy, Selah wanted to wed me to some prince of the earth."

"This vexed me, and I sprang from the bottom of the sea and landed on the shore of your island. There I was found by a merchant, and he at once brought me to you and sold me as a slave."

"But I have not treated you as a slave, dearest," said the King.

"No," said Rose of the Sea, very gently; "and because you have made me your Queen and loved me very dearly, I have not cast myself into the sea and gone back to my brother, as I intended to do. Now that I have a son, I must call Selah up to see him."

Rose of the Sea bade an attendant bring in a brazier of burning coal, and then she took a piece of aloe from a little box and threw it on the fire. As the smoke rose up and drifted out of the window, she said some words in a strange tongue.

The sea began to heave up, and the waves parted, and out of the waves rose a tall and handsome young man in splendid garments, and wearing a crown on his head. He was surrounded by a company of brilliant ladies and courtiers. The King of the Sea and his people came to the island and entered the palace.

"Ah, my dear Rose of the Sea," he said, as he saw his sister, "I have conquered all our enemies, and you can now return and marry some prince of the sea!"

"I am already married, my dear Selah," said Queen Rose of the Sea. "This is my husband, the King of Persia, and this is our little boy."

Selah took the baby in his arms, and then, to the horror of the King of Persia, he sprang out of the window and leapt down into the sea with it.

"Don't be afraid," said Queen Rose of the Sea. "Selah has only done what I meant to do. He wishes to see whether our baby can live under the water, as all the people of the sea can do."

So it was. In a few minutes Selah returned, bearing in his arms the little Prince, who was crowing with joy. He had breathed the salt water as easily as he breathed the air, and not a bit of his clothing was wet.

"What a day of wonders this is!" said the King of Persia. "If I had not seen it all with my own eyes, I should never have believed it."

He was at first much disappointed to find that he could not spring down to the bottom of the ocean and visit the marvelous kingdoms lying beneath the sea; but his son and his wife told him wonderful stories of the strange things that went on beneath the ocean.

A KING AND HIS COURT ROSE OUT OF THE SEA



Out of the waves rose a tall and handsome young man in splendid garments, and with a crown on his head. He was surrounded by a company of brilliant ladies and courtiers. The King of the Sea and his people came to the island and entered the palace. "Ah, my dear Rose of the Sea," he said, as he saw his sister, "I have conquered all our enemies, and you can now return and marry some prince of the sea!"

CINDERELLA AND THE GLASS SLIPPER

IN the days of the fairies there was a little girl named Cinderella. She had no mother, but she lived in a great house with her father, and was the happiest little girl in the world.

One day a strange lady came to the house with her two daughters, who were so finely dressed and so proud-looking that Cinderella felt very shy. But when her father told her that the strange lady was her new mother—her stepmother—and that the proud-looking young ladies were her new sisters, Cinderella was very glad, because she thought that they would be kind to her.

But the new sisters were not kind at all. They took her toys away, and gave her all the hard work to do. She had to wash the dishes, and sweep and scrub the floors. Sometimes, when she had done her work and was very tired and lonely, she would sit and watch the fire-fairies play among the cinders; and that is why they called her Cinderella.

One day Cinderella heard that the King was to give a very grand ball. The Prince was to be there, and all the great people were to dance with him. The proud sisters were going; but nobody thought of taking little Cinderella.

And Cinderella was very sad.

"I should like to go," she sobbed, when she saw her sisters' lovely dresses. "Oh, I should like to go to the ball!"

But when the carriage came and took the sisters to the palace, poor little Cinderella was left all alone. She sat down on her little stool and cried till the big tears splashed down on her little brown frock, and Cinderella said to herself again and again:

"I do want to go—I do want to go to the ball."

Then suddenly came a voice.

"And you shall go," said somebody.

Cinderella looked up, and there, standing at her side, was a fairy.

"I am your fairy godmother," she said. "Now, if you do just as I tell you, and ask no questions, you shall see what I can do."

She kissed Cinderella and wiped away her tears.

"First of all, you must fetch me a pumpkin," she said.

Cinderella ran into the garden, and brought the largest pumpkin she could

find. The fairy godmother bent down and touched it with her wand, and suddenly, as quick as lightning, the pumpkin was turned into the grandest coach Cinderella had ever seen, with blue velvet seats and silver doors.

"Now I want a mouse-trap," said her godmother.

Away ran Cinderella, and when she brought the mouse-trap, with six mice in it, the fairy touched that, too. Suddenly, in a minute, the six wee little mice that were squeaking inside were changed into six lovely white horses.

"And now," said the fairy, "bring me the rat-trap and two lizards."

Cinderella brought them, and the fairy turned them into a coachman and two great footmen.

Cinderella clapped her hands for joy, and did not know what to do because she was so happy.

"Shut your eyes!" cried the fairy.

Cinderella shut her eyes tight, and when she opened them again she found that she had on a beautiful frock, prettier than any she had ever seen, and on her feet were two little glass slippers. Then the fairy opened the door of the coach.

"Jump in," she cried, "and drive away to the ball! But remember one thing. Remember that *you must be home before the clock strikes twelve*. Promise me that you will obey me. Promise that you will do exactly as I say."

Cinderella promised, and drove off to the ball. When she got to the palace, who should come to meet her but the Prince himself. His coat was of blue satin, and at his side hung a beautiful sword with sparkling hilt. Taking Cinderella's hand he led her into the ball-room, and everybody left off dancing to look at the Prince and the beautiful maiden whose name nobody could guess.

Cinderella enjoyed dancing with the Prince so much that she forgot all about the time, and about her fairy godmother, until she caught sight of the clock. It was just going to strike twelve, and Cinderella became so frightened that she jumped up quickly and ran out of the ball-room as fast as she could go—so fast that one of her slippers came off. But she could not wait to pick it up.



CINDERELLA SAT AND WATCHED THE FIRE-FAIRIES PLAY AMONG THE CINDERS

The fairy is seen here touching the pumpkin with her wand and bringing out the wonderful coach. Cinderella is running downstairs as the clock strikes, losing her slipper, and the last picture shows her a kitchen-maid again, fitting on the slipper brought by the Prince's messenger, who, as soon as he finds that it fits her, leads her to the palace, where the Prince makes her his bride, and they live happily ever after.

On she ran, through the ball-room and down the stairs, past the tall footmen, and as she reached the door the clock struck twelve.

Cinderella trembled and ran out into the street, but, alas! the coach and horses had vanished. She looked at herself and found that her pretty dress had vanished too, and the little brown frock was there instead.

Poor little heart-broken Cinderella cried all the way home, and when the sisters came back from the ball they found her sobbing among the cinders.

The next day the King's messenger went round the city blowing a silver trumpet, and all the people came out to listen. He said the Prince had found a glass slipper which belonged to a beautiful lady with whom he had danced at the ball. No one knew who she was, but she was so gentle and sweet that the Prince had fallen in love with her, and he said that if only they could find her he would marry the lady who could wear the glass slipper.

All the ladies of the land came to try on this wonderful glass slipper, but it was so tiny that none of them could wear it. At last the messenger came to the

house where Cinderella lived. The stepsisters became so excited, and were so anxious to try on the slipper, that they could hardly wait to unfasten their shoes, and had to call for Cinderella's help. But when Cinderella saw the slipper she knew it at once. It was *her* shoe, which had slipped off at the ball when the clock struck twelve.

The two sisters tried and tried, but the shoe would *not* go on.

"Please *do* let me try it on," said Cinderella.

"You, indeed!" cried the sisters, pushing her away. "As if a kitchen-maid could wear such a shoe!"

But the messenger put out his hand and helped Cinderella into the chair. She took off her old shoe and put out her foot, and in a minute the wonderful slipper was on. It fitted perfectly.

Suddenly there was a sound like a rushing wind, and in a moment the fairy godmother appeared and with a touch of her wand Cinderella was a grand lady again.

Then Cinderella stepped into the coach which was waiting for her at the door and drove away with the messenger to the palace, where the Prince met her and made her his bride.

THE LEGEND OF THE WANDERING JEW

THE story is told that, as our Lord was carrying the cross up to Calvary, He stayed for a moment to rest by the house of a shoemaker, who drove Him away, saying:

"Go on! Go on! You shall not rest here."

And our Lord took up the cross, and said, "I am going to my rest, and you must wander until I return."

So the shoemaker was turned into the Wandering Jew, who will never find rest until our Lord comes again on earth at the Day of Judgment. The mark of a red cross appeared on his forehead, and he left his wife and children, and followed our Lord to Calvary, and then he turned away from Jerusalem, and began his long, strange pilgrimage.

On and on he went, a barefooted, tall old man, with his hair hanging about his shoulders, and a black bandage round his forehead to conceal the mark of the red cross there.

And on and on he still goes at the same

striding pace, over mountains and across deserts, and down all the long, white roads of the world. But a little rest is sometimes allowed to him. If he happens to be passing by a Christian church on Sunday morning, just as the service is beginning, he can enter and stand there and listen to the sermon.

In 1505 a weaver in Bohemia, whose name was Kokot, was trying to discover some treasure which his grandfather had hidden in the Royal palace. And as he was vainly digging here and there the Wandering Jew passed by.

"Your grandfather was burying the treasure the last time I came by here," said the Wandering Jew, "and, if I remember rightly, he was burying it beneath that wall there."

Kokot at once dug beneath the wall, and there he found the treasure. But before he could thank the Wandering Jew the strange pilgrim had passed out of sight.

THE NEXT STORIES ARE ON PAGE 881.

The Book of NATURE

WHAT THIS STORY TELLS US

ON a summer's day, by watching a pool, we may see water insects make their way from the pond, slip out of their skins, like a diver out of his diving-dress, and, unfolding their gossamer wings, fly away in the sunlit air. That is a picture, seen in an hour of present-day life, of what took place in the world on a greater scale, millions of years ago. Then, however, instead of an hour, ages passed while the change was made. Insects freed themselves from the waters, and fishes followed them to the land, changing into reptiles and animals. They learned to climb, and leap, and fly, in pursuit of food. In that manner the flying animals called bats were formed. Other animals, finding their food in trees, on the ground, or down in the soil, were content to leap, or climb, or burrow. Here we read of some of these little creatures which once came from the waters, and of the lives they now lead. They are links between the old kind of life and animal life to-day.

ANIMALS THAT FLY & BURROW

SOME of the commonest things in the world are the most interesting and wonderful. Let us see what mysteries the garden on a summer evening has for us. The sun has sunk from sight; the moon is up, the stars are shining. Birds have gone to their nests, yet dark figures are flying through the air, high up over the house-top and about it. What is that which flies so late, when birds, except the owls, should be sleeping?

It is not an owl; it is too small for that. It looks more like a swallow, as, dark and silent, it flits here and there. "It *must* be some strange night-bird," you say. But it is no bird; it is a bat—one of Nature's strangest little craftsmen—seeking its prey by night.

"A bat must be a sort of bird, seeing that it flies," you may say. You need not be ashamed to make that mistake. For hundreds of years wise men thought the bat was a bird. But it is not. It is as much an animal as the great ape, the horse, and the lion. It is a mammal. Every animal which feeds its young upon its own milk is called a mammal. A bird lays eggs, and feeds its little ones upon insects or other food which it collects in the fields. A bat does not lay eggs; it feeds its young with milk

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in just the same way as the sheep feeds her lamb.

The bat is one of the links between animal creation of to-day and the animal life which first appeared in the sea and upon the earth. Strange creatures came out of the sea, and began to live on the land and in the air. Creatures which had been fishes followed these to the land, and became accustomed to live half their lives upon dry ground and half in the sea. They became what we call amphibians.

It did not all happen in a day, or in a century; long ages passed while these creatures were being slowly changed from one form into another.

One of the changes made it necessary that some animals should be able to rise into the air, to seek their prey or to escape becoming the prey of others. They started climbing trees and leaping from branch to branch, and from the high branches to the ground. In that way one form of reptile became the first of birds, the archæopteryx, which means "ancient wing," of which we have read on page 53. In the same age the bats were perhaps formed. The first birds had great teeth, but no birds now have teeth. Bats have teeth, sharp and strong as the teeth of a tiny cat.

The most wonderful feature of the

bat is, of course, its wings. These are beautiful thin webs of tissue growing out from its body like an umbrella. If you could take away the webbing you would see a little animal with two arms and hands and two hind legs. But though it has the same number of fingers as we have, they are strangely formed. The thumb is very short, and, instead of a nail, has a claw or hook, which is used when the bat is not flying, to enable it to walk or to hang itself to anything upon which it means to rest when it folds its wings to go to sleep.

THE MYSTERIOUS ANIMAL THAT FLIES ABOUT IN THE NIGHT

The bones of the palms of the hand are not short and like ours, but very long, and joined to them are the finger-bones, which again are very long. This great length of bone is to support the web of the wings. The web stretches from the shoulders down the two bones of the arm over the bones of the hand, and down the tips of the four fingers. Then, from the under side of the arms, it reaches down to the legs, as far as what would be our ankles, and between the legs to join on to the tail.

Thus the spread of the wings is very big for the size of the bat. The biggest American bat has a body three inches long and a tail one and a half inches in length—only four and a half inches all told, yet its wings, when spread out, measure twelve inches from tip to tip.

There are few other common mammals of which we know less than the bat. The reason is that it only comes out at night. Its eyes are so formed that it must sleep when the sun is shining, but at night it can see splendidly. It lives entirely on insects, and by eating these does good work for man. We cannot see the insects which it catches, but the insects are in the air all the same; and if the bats did not catch them they would be a great nuisance to us.

SOMETHING ABOUT BATS THAT NO MAN CAN UNDERSTAND

There is something about the bat which none of us can understand. Added to its good sight, it has the most wonderful power of feeling its way through the air. There is a great network of nerves and veins all over its wings, and there are clusters of nerves about its nose which act as a sort of telegraph to control the wings as the little animal flies. To realize

what this sense of touch means to the bat, read this story:

A man who gave his life to the study of animals once tested bats in a strange way. He got some bats, whose sense of sight, and sense of smell, and sense of hearing had gone from them. There was no doubt about it; the bats could neither see, smell, nor hear. He turned them loose in a room in which were many corners and obstacles against which they were likely to dash themselves. They flew without fear about the room, and never came in contact with anything that might hurt them. Then the man strung many threads across the room, but the bats flew between them as easily as if nothing were there. When the man placed his hand in the way of their flying, though they could neither hear, see, nor smell, they avoided it.

Bats are like birds in this respect—that their blood is very hot, but there is this strange difference. The bird dies if it cannot keep warm. The bat, however, goes to sleep in winter. Its sleep is so like death that you would think the bat in its winter sleep dead. It almost ceases to breathe, and its body, so warm in summer, is in winter almost quite cold.

THE FLYING FOX, THAT EATS THE FARMERS' CROPS ABROAD

All the Northern bats, of which there are about fifty varieties, eat insects, but there are foreign bats which do great mischief. The fruit-eating bats do not live in this country, but in Japan, Australia, the Pacific Islands, the Malay Islands, India, Ceylon, Madagascar, and South America. The biggest of these measures nearly five feet across the wings. It is called the flying fox, because it has red-brown fur and a head like a fox. As they eat a great deal, they cause much damage to the crops, and in some places the natives have to tie up the growing fruit in baskets, to keep the bats from eating it at night.

The ugliest bat of all is one of the vampire bats, called the desmodus. This attacks cattle and horses and poultry, and even human beings, as they lie asleep. With its sharp teeth it makes a tiny hole in the flesh, and draws large quantities of blood from its victim. In some parts of the world it has been found impossible to keep poultry, owing to the dreadful habits of these bats. It

LITTLE ANIMALS THAT JUMP AND FLY



The bat flies, but is a little animal like a mouse, with huge webbed arms and feet used as wings. It lives on insects and sleeps all winter.



The fruit-bat in the tropics, which does great mischief by eating ripe fruit, is called the flying fox, because it has reddish fur and a head like a fox.



The flying lemur does not really fly, for it has no wings. Its skin is very loose, and it can spread it out like a kite and so leap through the air.



The flying phalanger leaps like the flying lemur. It has a pouch like the kangaroo, in which it carries its young till they are old enough to go alone.



The flying squirrel is a delightful little animal that can also take great flying leaps. It lives very largely on nuts, like other squirrels in our woods.



The gray squirrel is easily tamed, and will live in a half-wild state about parks and houses. It makes its nest and stores nuts, for winter use, in a hollow tree.

used to be supposed that the bite of the bat would kill a man, but that is not so, and the stories told of their causing men to bleed to death are not true. It is true, however, that they will draw blood when they can. They enter a room at dead of night, and if they find a man's feet uncovered they bite them, and draw blood till their appetite is satisfied.

There are other animals which are said to fly, but the bat is the only one which can fly as a bird does. The others seem to have stopped where the bat began when it started to fly. We have read already how the gibbon seems to fly as it leaps from tree to tree in the forest. Well, there is a very curious animal to-day which goes much nearer than the gibbon to flying.

This is called the flying lemur, though it is really not a lemur at all, and lives in the Indian Archipelago. It is an animal about twenty inches long, and lives in high trees.

THE CURIOUS LITTLE ANIMALS THAT LEAP TWO HUNDRED FEET

In the course of thousands of years, when seeking its food—nuts and fruit, and insects and eggs, and young birds—this kind of lemur has found that it is easier to leap from tree to tree than to come down one tree and run up another. So it has taken to leaping, and, in order better to leap, it has been used to spread out its arms and legs like sails, with the result that a great membrane, like a sail, has grown out from its skin and joined its legs and arms and tail together, so that, when it springs from the top of the tree, it sails through the air on a sort of raft of skin, something like a boy's kite. It can make leaps such as no other animal can equal. See it at the top of a tree. It wants something which it sees far away. Without a moment's hesitation it throws itself into the air, and sails to the spot, over two hundred feet at a jump!

Australia and New Guinea have flying animals called flying phalangers, and in various parts of the world there are flying squirrels. Then there is the flying mouse, or opossum mouse, as it is called. The flying phalangers and the flying mouse carry their babies in pouches; but we shall come to the pouched animals in our next story. Here we need only talk about their flying. They "fly" as the

lemur does, by the aid of a fold of skin extending along the four legs and sides, but not including the tail. This fold of skin is not stretched out until the animal wishes to leap through the air; at other times it is kept close by the side of the body.

THE FLYING SQUIRRELS AND THE CLEVER LITTLE SQUIRREL WORKERS

The flying squirrel is different from the phalangers, which eat insects. The flying squirrel is a rodent—it gnaws bark and buds and nuts like other forest squirrels. The phalangers and flying mouse can, to a slight extent, direct their flight, but the flying squirrel swoops down in a slanting direction, sixty feet at a bound, but without altering the direction of its motion.

Grey squirrels cannot fly, but they race about the trees at such a rate that they almost seem to do so. With their slim little bodies, their handsome, bushy tails, and their bright, large eyes, they are delightful little things to watch, as they scamper about the woods. Few animals are more playful when wild. They race and frisk about for the very joy of it. Yet they are among the cleverest little workmen in our land.

Although they make their homes in great shady trees, they know that rain and wind and snow come there, so they build the neatest little nests you ever saw. First they make a floor by lacing twigs in the fork of a tree, then they build a little roof over it, with the twigs so tightly woven that no rain can get through. Next, they carpet the floor of the nest with the nicest moss. The entrance is made at the bottom of the nest. On the opposite side there is another hole; through this the squirrel can escape if his enemy, the marten, or the cat, should pay him a visit. It serves also the purpose of ventilating the little home and keeping it always sweet and healthy.

HOW THE SQUIRREL WAKES UP FOR HIS NUTS AND GOES TO SLEEP AGAIN

But suppose that the wind blows the rain in through one of these little passages. Master Squirrel knows what to do. He takes up some moss in his clever little hands, and with it he blocks up the entrance through which the rain comes, and so is warm and snug again until the storm passes over.

Merry as he is while the summer and autumn last, the squirrel does not let the days pass in idleness. He collects nuts and berries, and stores them in holes in the trees or in little pits which he digs at the foot of the trees. When cold winter comes on he retires to his house to sleep. He sleeps a long time, though not as long as the bat. From time to time hunger wakes him. He gets up, runs off to one of his little storehouses, has a feast of nuts, and then goes back to bed to sleep again.

A traveler named Regnard says that in Lapland, where squirrels are numerous, there are many lakes and rivers to cross. The squirrels at certain times of the year have to change their homes, but the rivers and lakes are in the way. That does not stop them. The squirrels take the bark of a pine or a birch tree, drag it down to the water, and push it in. They then place themselves upon it, and set out for the opposite shore, while their big tails act as sails by catching the wind, and so driving their raft to the shore which they wish to reach. Sometimes the wind is too strong, and then there is a shipwreck, and the squirrel sailors are drowned.

THE GREAT MARCH OF THE LEMMINGS OVER THE MOUNTAINS

The bravery with which these squirrels are said to cross the waters may remind you of the lemming, another animal of Lapland. This is a rodent of about the size of a rat. Its numbers multiply greatly during the year, and at a certain season armies too big to count—big lemmings, little lemmings, young lemmings, old lemmings—set off on the march. They go in a straight line. They march over mountains and down valleys, they swim rivers and lakes; they pass through towns, they eat their way through crops. Bears, wolves, foxes, lynxes, hawks, and owls follow to prey on them. Multitudes of them perish on the way, but nothing stops the survivors until they reach their journey's end—which very often is the sea, into which they plunge, to be drowned at last.

German people call our little bats flitter-mice, and the big bats "rat-bats." They used to think that the bats were really mice and rats, which in some strange way had learned to fly. By

this time you will have learned that there is little likeness between bats and rats and mice. Our bats live entirely on insects; rats and mice do not eat insects. An insect is about the only thing a rat will not eat. Almost anything is good enough to make a rat's supper. They will eat eggs, young birds, fruit, butter, vegetables, good and bad; they eat one another; they will gnaw their way through the flesh of living animals which cannot help themselves; they have been known to gnaw the toes of elephants in captivity, and we have read already how they tried to eat the paws of the old lioness at the Dublin Zoo. They do more damage than any other animal in this country.

THE RATS, THAT LIVE ANYWHERE AND SPREAD DISEASE AMONG US

They can go almost anywhere. They can burrow under stone walls; by the help of their sharp claws they can climb up smooth fences; they can swim across rivers and streams. They live in the sewers; they live in the cellars and in the attics; under the floor of the dining-room; in ships, in docks and warehouses and shops. Wherever a rat can go and live, there you are almost certain to find one.

In olden days the rat was of real use to man. Before we had clever, careful men to look after the drains and sewers, rats helped to keep us healthy by eating up waste food and vegetables, which by decaying would have caused fever. But now we have better means of preserving health than by trusting to rats.

It has been discovered that rats themselves breed disease. They get into pigsties, and are sometimes eaten by the pigs. The rat has a disease which is passed on to the pig, and from the pig to human beings. That is not the worst danger. Rats have microbes in their fur which, when they come into contact with a human being, may convey disease.

THE GREAT WAR AGAINST RATS ALL OVER THE WORLD

So men have had to declare war upon the rat all over the world. But its numbers are so great, and it is such a cunning animal, that it is not easy to destroy. It is bold and brave, and when threatened by a man, from whom

it cannot escape it will savagely attack him with its sharp, strong teeth.

The grey house-rat, sometimes called the Norway rat, is not a native of America, but of China. It came west long ago, and began to be noticed in England about 200 years ago. England then had a native black rat, some of which came to New England in the earliest ships. The grey rats killed off the black ones, and have spread all over the world by getting into the holds of ships, and then going ashore at various ports. They can endure any climate, and thrive on any food. It should be the effort of everyone to keep them out of their houses, and to kill them.

Mice are almost as destructive as rats. Ladies are very much afraid of them, not because the little animals are dangerous, but because they run so nimbly and can climb about with such skill. They multiply as rapidly as the rat, and are only less dreaded in a house because they cannot eat so much and because they are not fierce.

THE MANY KINDS OF MICE LIVING IN THE WOODS AND FIELDS

There are many varieties of mice. There is the beautiful little harvest mouse, which weaves a wonderful nest on the stems of grass in the fields; and there are also the field-mice. Most of them live wild in the woods and fields.

One of the prettiest is the German dormouse, which is a little gem, of light, reddish-brown color, with a little short tail. Many children keep dormice as pets. They are not very satisfactory, because, while the children are up, the dormice want to be in bed. Like bats, they want to sleep in the daytime and to work at night.

Although you might not think it, the dormouse is a great jumper. His feet are beautifully padded, so that when he reaches the ground after a big leap he shall not hurt himself. This little animal eats hazel-nuts and acorns when these are plentiful; but before the nuts ripen it eats grain and corn and the seeds of flowers, and the eggs of small birds. In this way it may do damage, but then it makes up for this by eating a great number of grubs and caterpillars and other insects which would injure our crops.

The dormouse makes a beautiful nest

like a bird's, in big nut-bushes. It stores the nest with food which it can eat should it wake up in the winter feeling hungry. Luckily it does not wake when the weather is cold, so there is not much chance of its food supply running short before it comes out again into the world in April.

THE MICE THAT LIVE IN THE STRAWBERRY-HOUSE AND EAT THE SEEDS

There is plenty of food out in the woods and fields for mice, provided that they do not become too numerous. They eat the nuts which fall from the beech, the oak, and other trees. It is when food is scarce and the mice too many that they become a nuisance. In the garden of the house in which this story is written there are hothouses in which strawberries are grown. When the field-mice become so numerous that they cannot get enough to eat, they make their way to where these strawberries are, and eat them. It is not the fruit itself which they like, but those little seeds which you see on the side of the strawberry. Strawberries like these, grown when there are no strawberries in the fields, are very expensive, so you may be sure that the mice are not welcome when they are doing this damage.

But there is a lesson for us here, which shows that, wise as man is, Nature is wiser. When we plough up the land or cut down the woods in which the mice have lived, they are driven into our houses. On the other hand, if we let the mice get too numerous, the same thing happens. We let them get too numerous by destroying our friends and their enemies.

Gardeners and farmers shoot owls and other birds and animals which live upon mice and rats. The result is that the mice multiply alarmingly, and become so desperate for food that they destroy the corn-stacks, gnaw off the bark of young trees, eat the buds of fruit-trees, bite off all the young shoots of such trees as they can eat, and create havoc.

THE MICE THAT RAN INTO THE PITS IN THE FOREST OF DEAN

They tunnel in the ground and eat up the grain the farmer has sown, and so do more damage than you could believe.

There was a plague of mice in the South of England some years ago. They gnawed the roots of the young oak-trees,

ANIMALS THAT TUNNEL IN THE EARTH



The black rat is the original American rat, and is now extremely rare. It is not so strong as the grey rat.



The grey rat is supposed to have come in cargo ships from Norway. It has almost killed off the black rat.



Everyone knows the common house-mouse. It is a pretty little creature, but destructive.



The harvest mouse is the smallest of British mice. It lives in the fields and makes a clever nest among the grain.



The dormouse is a reddish-brown color with a short and hairy tail. They generally sleep during the day and feed at night, and are torpid in winter. They can jump a height of six feet.



The lemming lives in Lapland. Huge companies of them often travel across the country, and nothing but fire will stop them.



The field-vole is not a mouse. It has a thicker head and a shorter tail. It is often so plentiful that it becomes a plague by 'eating farmers' crops.



The water-vole lives by the riverside and feeds on plants. It never destroys fish, and ought not to be treated as an enemy. It swims and dives well.

they killed the chestnut-trees; they gnawed the bark from the hollies, and nibbled off all their buds.

People did not know what to do, until they asked a wise old man who was in the habit of making pits and wells. He knew what to do. He found that mice tumbled down the pits which he dug, and could not get out. So he made a great number of pits where the mice were. He made each pit two feet deep, and two feet wide at the top, but rather wider at the bottom. The pits were made about twenty yards from each other. Mice tumbled into these in thousands. He himself was paid rewards for catching 100,000 mice; but that was not nearly all that were caught.

Weasels from all parts of the countryside gathered about the pits, and ate fat mice night after night. Owls and kites and hawks got news of the feast, and swarmed down upon the pits, and ate till they could eat no more.

THE HANDSOME LITTLE VOLE THAT IS BLAMED FOR THE RAT

Mice are not the only wild things in the fields which do damage. There are also the voles. The field-vole is about five inches long, including the tail, which measures a little over an inch. Its body is about as big as that of a big house-mouse, but its tail is shorter. The house-mouse has a scaly tail, like the rat, but the field-vole's tail is hairy.

Sometimes in the lowlands of Scotland it appears in vast hordes. Then the swarm will destroy a thousand birch-trees in a single district by gnawing the bark away. Sheep have been starved in Yorkshire through the field-voles eating all the grass. In Germany harvests have been ruined, although 1,500,000 voles were once killed in a fortnight.

This vole, which is so much heard of as creating what are called "plagues of mice" in Europe, is represented in the United States and Canada by several similar kinds of animals, which we call meadow-mice, or short-tailed field-mice. They are chunky in form, with blunt noses, and have short, hairy tails. All would rather live in damp than in dry places, although none are actually aquatic, as is the large brown bank-vole, or water-vole, so well known in the rural parts of England. They throng in marshes, and especially in salt marshes near the ocean-coast, and seem to know

in a wonderful way when the tide is coming, or when the ground is to be overflowed, for they rarely get overtaken by water and have to take to swimming.

In such marshes, and in wet meadows everywhere, you may see their little paths cut through the grass, along which they scamper back and forth. Now and then, if you watch quietly, you may see a meadow-mouse itself; but not often, for they are shy, and, besides, they go abroad by night more than by day, when they stay hidden snugly in a shallow burrow just beneath the sod. In winter they make warmer nests, and run around in tunnels through the old herbage and leaves under the snow. It is then that they do most of the damage chargeable to them, for there is no insect food or green plants to eat, and so they gnaw the bark from about the base and roots of orchard trees, and often spoil whole nurseries of young trees and bushes which have been wrapped in straw to protect them from freezing. The meadow-mice think this is fine, for the straw makes them a snug house, and the young bark is capital food.

THE PRETTY WOOD-MICE AND THE PRAIRIE-MICE THAT MAKE NESTS AND BURROWS IN OUR WOODS AND PLAINS

North America abounds in true wild mice, and many of them are delightful little animals, that do little or no harm, except by stealing some of the farmer's grain. The commonest of these in the east is the white-footed deer-mouse, which is so called because it has a coat of the same fawn-red color as that of the Virginian deer. It lives in bushy places, eating seeds and insects and nibbling berries, with much the same habits, in fact, as the squirrels, and, like them, it makes a great store of seeds and small grain stowed in holes in the ground or in old logs. It is fond of packing an old bird's nest full of hay to make a winter nest, but does not stay in it all the time. Another common red mouse is the jumping-mouse, which has great hind legs and a very long tail, and is, in fact, a real American jerboa. In winter it sleeps in a nest almost underground.

There are several very interesting and beautiful western mice, called kangaroo-mice, pocket-mice, and so on, of which you may read in books.

THE NEXT NATURE STORIES ARE ON PAGE 873



WHY DOES A MATCH STRIKE?

MATCHES are very useful, and also very interesting things, said the Wise Man, and there is a lot to say about them, but first of all I can answer your question very quickly. A match strikes because you make it warm by rubbing it.

You know that you have to rub it against something rather rough, so that there is a good deal of friction. The movement of the match is hindered by the rough thing you press it against, and that is what we mean by friction. This makes the match hot. Rub the tip of your finger on your coat, and you will make it hot, too.

Now, the whole point about the match is that its head is made of a mixture of things to which nothing happens as long as they are kept ordinarily cool, but as soon as they are made hot enough they catch fire—that is to say, they combine with the oxygen of the air, and so burn.

Our business, then, is to get a kind of mixture which will stay on the end of a piece of wood, or some such thing, and will catch fire even when made only so hot as we can make it by rubbing. About a hundred years ago the first friction match was made, and almost the best of these at first required a lot of friction, for it had to be drawn up between pieces of sand-paper before it would catch fire. Then the curious element called

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phosphorus, which really means light-bearer, began to be used, and matches were made very like those that we use now.

The peculiarity of phosphorus is that it readily catches fire just as we want it to do, but a number of other things are put into the match-head, and especially something which itself contains oxygen, and can supply it for purposes of burning even more readily than the oxygen of the air. That is why you get a little explosion when you strike a match.

But, of course, there is a certain amount of danger in having anything which will catch fire so readily. Thus, if you have ordinary matches loose in your pocket, they may get accidentally rubbed and will catch fire. Therefore, it was a question whether there could not be made some kind of match which could be struck quite readily, but of which we could be sure that it would strike only when we really meant it to do so.

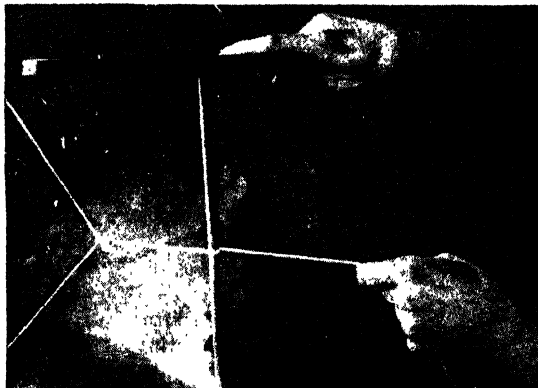
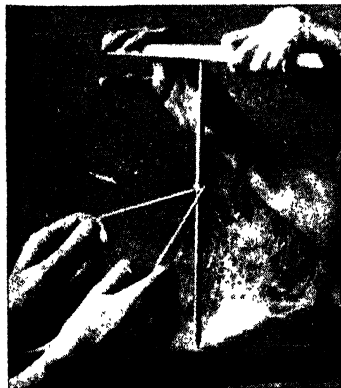
This kind of match was invented early in the nineteenth century, and we call them safety matches. The point about them is that there is no phosphorus in their heads; the phosphorus is put on the outside of the box instead, and so this kind of match is almost certain not to catch light except when it is purposely struck where the phosphorus is.

THE EARLIEST WAYS OF MAKING A FIRE



There was once a time when man did not know how to strike a light or make a fire to warm himself or to cook his food. But one day he found out that by rubbing dry wood together he could produce enough heat to set light to dry grass or moss and thus make a fire. This picture shows one of the ways in which he did this.

Another way in which man rubbed the wood was to twirl a dry stick in a hole, or socket, cut in a dry plank or tree-trunk. This caused smoke to rise, and then fire would burst forth as shown.



Later man found that by using a socketed piece of wood to hold his fire-stick upright, and getting a friend to pull the stick round, it could be made to revolve more rapidly, so that fire came quickly.

Man then learned to make fire alone by holding his socketed stick in one hand and pulling the string with the other, attaching the other end of the string to the cord of his bow, which he fixed at a convenient place. When he left off pulling, the stretching of the bow pulled the string back, so making the fire-stick revolve.



Another way was to cut a slot in a piece of bamboo, and saw this slot with another piece of bamboo, as in the first of these two pictures. Little fragments were worked off, and the friction caused these to catch fire. Man made a great step towards matches when he discovered that by striking a piece of metallic stone against a flint he caused a spark to fall. He used to catch the sparks upon a little heap of dry moss, so kindling a fire.

HOW MAN LEARNED TO STRIKE A LIGHT



When iron and steel became known to man, he was able to improve his fire-making outfit. He had a rough box in which to keep his piece of flint, steel, and half-burnt cloth, called tinder, upon which he caught his sparks. This picture shows how the steel was struck upon the flint, driving a spark into the box, from which the thin smoke rising shows that the tinder is smoldering.



This is a tinder-box like a pistol. A piece of flint was shot against the upright piece of steel, and a spark fell into a box below so rapidly that wind or rain could not put it out. A bundle of sulphur-tipped wood matches is below.



The first match at all like those which we use to-day was invented by a Frenchman named Chancel in 1805. The chemicals which formed its head burst into flame when dipped into a bottle of acid.



A little later the matches shown here came into use. Each was made of rolled-up paper, the tip being dipped in chemical preparation. Within the tip was a tiny glass bulb filled with acid; and when this was broken by pressure between pincers the acid escaped, mingled with the chemicals, and set fire to them.



The first practical lucifer match was invented by John Walker, an Englishman. It was a match very like those which we use to-day, and was struck by drawing it through a piece of folded sandpaper. These matches were sold at two cents a dozen.



The safety match strikes easily and is safe. It is one of the simplest and tiniest of things, yet it took man hundreds of years to learn how it could be made.

Winter was almost upon them, and with more haste than care, they built themselves "a half-faced camp" of logs.

In the autumn of 1818 a strange sickness broke out all over the countryside, killing men and cattle by the dozens. Mrs. Lincoln was among the ones stricken. A week after she was taken ill, her husband and little son, with heavy hearts, built the rough pine coffin for the wife and mother, who had loved them so well and served them so faithfully. A winter of dismal loneliness descended upon the Lincoln family. The children missed her piteously. Often their father was away for long hunting trips, leaving them alone in the cabin in the wilderness. Night would find the two huddled together against the cabin wall, their arms about each other, their ears straining for the sound of footsteps that did not come, and hearing only the dismal howling of the wild animals that prowled about in the darkness.

It was a happy day for them, when their father brought home a new mother, with her son and two daughters. At first the Lincoln children hung back shyly from the newcomers. But the sweet motherly ways of the new Mrs. Lincoln soon won their hearts. She was a very capable woman. It was not long before she had the disorderly cabin spick and span. She brought with her some new furniture and a goodly array of bright pots and pans, and soon the place was fairly shining with a sweet wholesomeness and comfort it had never known before.

When Abraham was eleven years old a schoolhouse was built not very far from their home, and the question again arose whether the boy should be allowed to attend. His father contended that a big, able-bodied boy like Abe was of more use on their little farm than he could ever be at school; but his new mother said, "No, the boy must be given an education." Abraham went to school and this was the beginning of his love for books. The boy's school life was irregular, for he was much needed on the farm. In all he attended school hardly more than a year, but he never let an opportunity slip to read everything on which he could lay his hands. Many weary miles Abraham traveled to borrow books. After his day's work was ended he would read as long as it was light, then, lying on the floor in front of the

fireplace, with the aid of the glowing coals, he would read on into the night, often writing his compositions on a wooden shovel with a piece of charcoal. When the surface was covered he was sometimes obliged to shave off the first part of his work to make room for the last.

At nineteen, Lincoln made a trip in a flatboat, down the Mississippi River to New Orleans. It was not long after this, that the Lincoln family once more started on the trail. This time they moved to Illinois. There young Lincoln helped to build the log cabin, and to split rails to fence the fields. After another trip to New Orleans, he took a position as clerk in charge of a store in New Salem. When the Black Hawk War opened in 1832, he was elected captain of a company, but saw no hostile Indians. He then bought a little store, but was not successful, and did some land-surveying. Lincoln's public career began at the close of the war, when, for a time, he served as postmaster in New Salem.

About this time he "was a tall, gawky looking fellow, wearing a wide-brimmed straw hat without a band, a homespun shirt and claw-hammer coat, and tow trousers that did not meet his shoes by several inches." Strangers felt when they looked at him, "This man is a clown." The moment he opened his mouth to speak, all consciousness of his uncouth appearance vanished from their minds. Here was a man who dealt with souls. The people had so much confidence in him that they elected him to the legislature in 1834, and he was re-elected three times. Meanwhile he studied law, and was admitted to practice in 1836. In 1846 he was elected to Congress, and served one term.

For several years after his return from Washington he devoted himself entirely to the practice of law; but, in 1854, when the entire country was roused over the Kansas-Nebraska Bill regarding the admission of slave states to the Union, Lincoln again came to the front and took an active part in public affairs. He protested that "slavery is founded on both injustice and bad policy." Then followed the famous debates between Lincoln and Stephen A. Douglas, the "Little Giant" of Western politics. Both were candidates for the United States Senate, in 1858, and

the debates caused much excitement. Douglas was elected, but Lincoln had gained a great reputation.

In 1860 Lincoln was nominated for the presidency by the Republican party, and was elected in November. Upon the news of his election the long expected division of the nation upon the slave question occurred. South Carolina soon seceded, and others followed until there were eleven states in the Confederacy. On the 11th of February, 1861, Lincoln spoke a few words of farewell to his own people, and with a sad heart turned toward the capital, "to assume a task more difficult than that which devolved upon Washington." The outlook was indeed gloomy.

In the beginning the new President did not have the support of all in the North. Many were opposed to keeping states in the Union by force, and others dreaded the rule of the new Republican party. Several leaders of the party were much better known than he, and some of them had expected to be named for the high office which had gone to the uncouth, uneducated Westerner. They could not understand a man who told funny stories in such a time, for they did not see that every one of his stories had a point which illustrated the matter in hand. These people thought that the country was in the care of a man who could not save it.

The Civil War opened with the firing upon Fort Sumter by the Confederates, and the years that followed were full of trial and terror to the nation. Steadfast amid the clamor of his foes Lincoln held to his purpose and policy to unite the North and South. But while the President toiled in the executive office, his heart was bleeding for his fellow countrymen who were falling by the thousand on the field of battle, sorrowing even as a father in the sorrows of his children. He had but one thought through all those dark years,—*the preservation of the Union*. "If I could save the Union without freeing any slave," he wrote a friend, "I would do it; and if I could save it by freeing all the slaves, I would do it; and if I could save it by freeing some and leaving others alone, I would do that. What I do about slavery and the colored race, I do because I believe it helps to save the Union: and what I forbear, I forbear because I do not believe it would help save the Union."

On the first day of January, 1863, President Lincoln issued the Emancipation Proclamation, freeing all the slaves in the Confederate States of America. In 1864 he was re-elected to the presidency, but the pressure of public affairs became so unbearable that it seemed as if this strong man were carrying more than he could endure in heart and mind. "I think I shall hardly live out this term of the Presidency, the burden is so great," he said. Yet there was nothing of weakness about Abraham Lincoln. He faced each problem squarely as it came.

With the sure hand of a leader of men he guided the nation into peace at last. General Lee surrendered at Appomattox, April 9, 1865. It was certain that there would be little more fighting. The President's purpose was accomplished, the Union was saved. The country went wild with joy. Bells were rung; and the people shouted the good news to each other, laughing as they told it; while prayers of thanksgiving were offered up in the churches all over the land.

In the midst of rejoicing there came a great shock. While attending the theatre, in Washington, April 14, 1865, the President was shot in the head by an actor, John Wilkes Booth. The assassin entered his box, shot his victim, and sprang to the stage below. He fell and broke his leg, but managed to reach his horse, which he had left at the door, and galloped away. But for his accident he might have escaped. As it was he was able to conceal himself from the thousands searching for him for twelve days. Finally he was trapped in a barn, and shot when he refused to surrender.

It was only when the first fury for revenge was over that the people came to the real bitterness of their loss. "This was a Man," they said, and choked as they said it. Of Abraham Lincoln, Robert Ingersoll wrote:—"It is the glory of Lincoln that, having almost absolute power, he never abused it, except on the side of mercy. Wealth could not purchase, power could not awe, this divine, this loving man. He knew no fear except the fear of doing wrong. Hating slavery, pitying the master—seeking to conquer, not persons, but prejudices—he was the embodiment of self-denial, the courage, the hope and the nobility of a nation. He raised his hands, not to strike, but in benediction. . . . Lincoln

of air—which is the noise we call thunder. This noise, or sound wave, comes after the light wave, simply because sound waves move more slowly than light waves.

Now, here is something that will be of use to you in the case of a thunderstorm, especially when people are frightened, as many children are if they have been told foolish stories, and as some children and even grown-up people are, stories or no stories. For when there are some seconds between the lightning and the thunder, we know that the storm is really far away. The further the storm, the longer the interval between the lightning and the thunder; and you can comfort frightened people who think the electricity in the storm may hurt them by showing them that it must really be far away, since the sound comes so long after the lightning.

WHAT MAKES US SNEEZE?

Usually we sneeze because there is something in our nose that should not be there. The nose is the proper channel for the air we live by, and our brain is made so that when anything interferes with this channel it makes us breathe out violently through the nose, and that is a sneeze. The inside of the nose must be very ready to feel the least thing so as to tell the brain what is wanted. Of course, it is not *we* that do this—indeed, we can't really sneeze on purpose if we try—but it is the unthinking part of our brain; and as it cannot always tell whether sneezing is needed or not, it often makes us sneeze when the blast of air through the nose has nothing to clear away, and the only trouble is a little itching.

We sneeze at pepper, because it irritates, or violently tickles, the inside of the nose. One kind of sneezing is due to something in the way the nerves of the brain are connected, and is not a bit of use, and that is sneezing at a bright light, usually the sun. To blink at the sun is sensible, for that protects the eyes, but there is really no sense in sneezing at it. You can stop a sneeze almost always, when you feel it coming, by pressing on the nose, especially on each side, about half-way down, just where the bone stops. There is a little nerve here which, when it is pressed, tells the brain to go no further. No one really knows the reason why.

WHAT MAKES US YAWN?

We yawn when we are tired, or sleepy, or bored. Now, in all these states the truth is that we are not breathing as deeply as we should, and our blood has not got enough air—or, rather, enough oxygen from the air—in it. There is a tiny but precious speck of nerve stuff in our brains which looks after our breathing, and it is very sensitive to changes in the blood, when these mean that something is not quite right. When it finds that there is not enough oxygen in the blood—and it seems to find this out suddenly—it gives an order for a great deep breath that shall put things right. And that is why we yawn, for a yawn is simply a sudden deep breath *inwards*, just as a sneeze is simply a sudden deep breath *outwards*. When people are not quite well, they sometimes yawn almost all day, and this is not a good sign, for it means that their breathing is not doing its work properly, and that these repeated efforts to catch up with the need for air have become necessary.

WHAT MAKES US STRETCH?

This question, said the Wise Man, might have gone in with the last, for we often stretch and yawn together, and really for the same reason. When first we are born, we always stretch and yawn, and if a baby does not do this, people have to smack it gently until it does; for a baby must breathe well, and yawning and stretching mean good breathing. The stretching does not *directly* help us to breathe, but it does so in a roundabout way. When we stretch our limbs and body, we squeeze upon many of our blood-vessels, especially those inside our muscles, and so we make it harder, for the moment, for the heart to drive the blood in through them. This, however, is just the little spur the heart needs, and it at once replies by beating more strongly.

By this time we have stopped stretching, and so the heart, without having any harder work to do than before, is working harder. So the blood moves more quickly through the body, *including the lungs*. Now, it is the blood that carries the air from the lungs to every part of the body, and the quicker it goes through the lungs, the more air it can

wake up. So stretching helps us to breathe, and fits in perfectly with the taking of an extra supply of air into the lungs, which is what yawning does for us. Really, then, yawning and stretching are wonderful powers of the body, beautifully fitted for their purpose. It is, of course, the brain that looks after them both, and fortunately it does not need teaching, but we are born with brains that know how to do it.

WHY IS IT RUDE TO YAWN AND STRETCH?

You will be surprised, perhaps, that I should praise yawning and stretching, though they are rude. They are rude, not in themselves—no one minds you yawning and stretching when you are alone—but because people know that they are signs of tiredness or being bored; and if you do these things in company it is almost like saying that your friends are tiring you. That hurts their feelings—it would hurt yours—and so it is rightly called rude. If you must yawn, you should put your hand to your mouth. I believe, said the Wise Man, this really began in a silly idea that little goblins ran in and out of the mouth when it was opened; but you should do it all the same, for it hides your face when the yawn is making it ugly, and you have no right to force other people to look at ugly things.

WHY IS THIS BOOK EASIER THAN LESSON BOOKS?

This is a nice question, said the Wise Man, and a useful one. I am sure there are some lesson books, or there ought to be, which are no harder than this book. But the trouble with most lesson books is that they begin as a grown-up man would begin, if he were to learn a new thing, or as he thinks he would begin. But the right idea is to make a book for children which takes things just as the child would take them for itself. The child's mind has its own ways of learning things, and if you attend to those ways the child learns quite easily; but if you try to make it learn your way, then, of course, the child finds things hard. I fancy, added the Wise Man, that this book is mostly written by men who have children of their own, and who have learnt from those children how to teach them; and when you find something too hard, the reason will be, not that you are stupid,

but that we have not learned our lesson quite well enough. The whole secret of all teaching, everywhere, always, is to understand, if you can, the mind of the person who is to learn.

WHAT DOES ENCYCLOPÆDIA MEAN?

This is quite an easy question, even though the name of this book is longer than any word in it. *En* means *in*, and is added to make the word stronger; indeed, the word is often used without the *en*, and just written *cyclopædia*. Then the next part of the word comes from the Greek word *cyclos*, a circle, and tells us that the book is not about one thing only, but goes all the way round knowledge. And the last part of the word is just the English form of a Greek word *paideia*, which means teaching or instruction. So this book is a circle of teaching.

But, since you ask me, I think the name is better even than it looks, and that perhaps this is the only kind of book that ought to have this name; for the word that means teaching comes in Greek from another word, *pais*, which means a child, because, of course, teaching suggests a child, and a child suggests teaching. So the very word tells us that it has something to do with a child. There is a long English word for school-master made from Greek, and it begins with *paed*, which really means the *man who drives a child*; but the word is so ugly, and gives such an ugly idea of a schoolmaster, that we need say no more about it.

WHAT ARE OUR EYEBROWS FOR?

This is an easy question to which we ought all to know the answer, yet many grown-up people could not tell you. There are two reasons why we have eyebrows. One is a reason of use, and the other a reason of beauty. In the first place, if we had none, the drops of sweat that form on our foreheads when we get warm would run into our eyes; and this would be bad, not only because it would blur our seeing, but also because sweat is really poisonous and a thing to get rid of, which is one of the reasons for washing.

Now, our eyebrows catch the drops of sweat, and turn them aside. That is quite a good enough reason in itself, but there is another. The eyes are the

most beautiful and interesting part of our faces, not only from their form, but also because they and the eyelids move so quickly, and so give the idea of life. That is why a face looks so different when the eyes are shut. Now, the eyebrows are not only beautiful in themselves, but they have the special purpose of calling attention to the eyes, just as we draw attention to a specially important word in a letter by underlining it. That is why some foolish people make their eyebrows darker than they really are; but if you have a bright and healthy mind your eyes will look nice enough without any silly help of that kind.

WHY ARE TEARS SALT?

Now, you will say that there can be no harm in having sweat in our eyes, at least a little of it, since we have tears in our eyes, and they do not hurt us. But there is a great difference.

Tears are made to wash the eyes, and there is no poison in them. In fact, if you took just the right quantity of ordinary table-salt, and melted it in perfectly pure water, you would have something almost exactly the same as tears; and we know also why it is that pure water without any salt in it would not do for tears. Quite pure water is found to injure *all* delicate living things, like the front of the eyeball, and it is not natural to the body. The natural kind of water in which every part of the body lives its life is salt water. If you melt the right amount of salt in water, you have something which men who study these things call "normal salt solution," meaning that it exactly suits every part of the body, neither exciting it nor weakening it. This normal solution, which is just the same as tears, is used when we are studying any part of the living body; and it is used by surgeons rather than pure water, and all for the same reason. So next time you help yourself to salt you will know where some of it goes, and why your body needs it.

WHAT MAKES A NETTLE STING?

The leaves of a stinging-nettle—though not those of the so-called "dead-nettle," which is a wholly different plant, though the leaves look much the same—are covered with small hairs with sharp,

hooked points, that will break off when they are lightly touched. But the nettle doesn't merely prick: it *stings*. This is because the hairs are filled with an acid which gets under our skin, through the hole made by the point of the hair. This makes our skin uncomfortable. *Formis* is Latin for an ant, and this acid is called formic acid because it is found in the bodies of ants. There it probably prevents other animals from eating the ants, because it is not nice to taste. This is one of the thousands of ways in which animals and plants protect themselves from their enemies—like the poisoned tooth of the serpent, the inky stuff made by an animal that lives in the sea, so as to blind its enemies, the unpleasant and often poisonous oils found in the leaves of certain plants like the tobacco-plant.

WHY DO BEES STING?

The use of the bee's sting is exactly the same, in its way, as the use of the nettles' stinging hairs. The sting is really a fine, sharp, barbed tube, through which a drop of poisonous stuff can be sent when the bee stings. It is the worker-bees that sting—those that do the work of the hive. The case of wasps is the same. A bee usually can sting only once, for the barb, which is such a nuisance to us when we are stung, prevents the sting from being withdrawn. It is torn away from the bee's body, and the bee is so injured that it usually dies. Thus a bee stings only when its position is desperate.

I think the case of the bee's sting is interesting, for it shows how completely each bee is made for the good of the whole hive. No other creatures in the world show this so well. It is actually armed with a weapon which, to be effective, has to be made so that its use kills its owner, and it is not a weapon of offence even, but of defence only, and only for extreme cases.

If we do not make ourselves offensive to the bee, it will never sting us. Lord Avebury in England, and Dr. Forel in Switzerland, who made a deep study of bees and wasps, let them crawl on their hands and faces, and never got stung. But, if you get out your handkerchief and attack the bee, it does its duty, even at the cost of its life, and you have to pay a price too.

THE NEXT QUESTIONS BEGIN ON PAGE 911.



THE BLUE BOY, A FAMOUS PORTRAIT OF A HUNDRED YEARS AGO

This fine portrait was painted by Thomas Gainsborough, R. A., to show how blue could be used as the chief colour in a picture.

The Book of OUR OWN LIFE

WHAT THIS STORY TELLS US

THERE are many things in the world that we cannot see ; there are more things, indeed, that we cannot see than all the things we can see. We cannot see the simplest kind of living creatures that share the world with us. The smallest living things are called microbes, and are so small that if we put 20,000 side by side they would not reach across a penny. These microbes multiply faster than we can think. If we had one microbe at the moment we read this, and gave it enough to eat, there would grow from it in an hour or two more microbes than there are people in the world. Microbes are almost everywhere, in our bodies and in everything we touch, and they split themselves up so that one becomes two. Some are harmful and make us ill ; others keep us well ; and whether we are ill or well depends upon the way we treat these little creatures that inhabit our bodies. Every one of us is like a kingdom, with invisible armies of microbes fighting for us and against us.

THE TINIEST LIVING THINGS

WE have to talk now about the simplest kinds of living creatures that we know, and about the things they do, not only because they are very interesting in themselves, but also because their life affects the story of the earth, which they are constantly changing in many ways.

These living things are extremely small ; they have many names, and are often called *germs*. You have perhaps heard about germs already, as this is the name applied to these things when they make us ill, as they often do. They are then called the germs of disease. But the great Frenchman, Pasteur, who found out that some of these things often make us ill, called them *microbes*, a word which really means small life, and which tells us that we are talking about living things of very small size.

Since they so often make us ill, most people think that all microbes are evil, and that there are none which are of any use. Now, I want you to learn that really these microbes, which men discovered only in the last century, are necessary for all the life of the earth, including our own. It is only a very few kinds of microbes, really, that make us ill, and can therefore be called the germs of disease. By far the greater number of the microbes are not

CONTINUED FROM 075



merely perfectly harmless to us, but we could not live without them. It is

well that we should learn, as soon as possible, that these wonderful little creatures exist, and that they play a great part

in the story of life and of the earth.

The first thing to learn about microbes is that they are very small—so small that unless we have some way to help our eyes we can never see them ; and, indeed, some people believe that there are many microbes so small that, however much we help our eyes, we cannot see them even then.

Men, therefore, could not know that microbes existed until the invention of the wonderful instrument called the microscope—an arrangement of pieces of glass in a tube, which magnifies small things, so that we can see them. Yet even the microscope would not be sufficient alone to show us how many kinds of microbes there are, and to teach us that they are almost everywhere.

When I say everywhere, I do not mean that you can find microbes in a fire—because, of course, they cannot live there ; and, also, you will not find many microbes in the air if you go far out to sea in a ship and examine the air there, but you will always find microbes in the earth. They abound in ordinary air, they are

on everything you can touch, in the house or out of doors, and they have even been found in the snow in the Arctic regions. They are to be found in all water. So, practically, they are simply everywhere—tiny living creatures, living their own lives, and, in consequence, doing things all the time. It would be very bad for us if they were all hurtful to us.

HOW YOU CAN WATCH THE MICROBES GROWING FROM DAY TO DAY

There are still a few people who are inclined to think that microbes do not exist, but that is simply because these people have never taken an opportunity of seeing them for themselves. But really this is quite easy, and there is no doubt that the little things are alive, because you can see them moving about.

It is also a very easy thing to grow microbes. You may take a few just by dipping the point of a needle in something containing them, and then you may put them into some milk—one of the best things for growing microbes in—or in a little beef jelly, or you may stroke the needle across the cut surface of a potato; and in these and in many other ways you can watch microbes growing from day to day. Of course, you cannot see the separate microbes, but you can see the colony of them as a whole, and, as different kinds have different ways of spreading, anyone who knows them can pick up the tubes in which they are growing, and say what kind of microbe a tube contains.

THE WONDERFUL LITTLE CELL THAT DOES ALL THE WORK OF LIFE

In some ways all microbes are very easy to understand, because they are so very simply made—that is to say, they look simple and they are very easy to describe; but then there are thousands of different kinds of them, though most of them look so much alike, and these differences must depend upon differences in the way in which they are constructed. These microbes are too small for us to see this, but, so far as we can see, they are all made very much alike.

Every microbe simply consists of one little piece of living matter, called a *cell*. That is its whole body, and does all the work of a living creature for it. Some microbes are round, and some are like little short rods; some are very thick, and some, like those which cause in-

fluenza and tuberculosis, are very slender; but all microbes, whether harmless or dangerous, and wherever they live, consist of one cell, as it is called.

It is very important to realize that a complete living creature, which moves and grows, can do these things, even though it has no mouth or lungs or muscles. We have to learn that many of the things we do by means of many different parts of our body made specially for the purpose can be done by living creatures that simply consist of a single living cell, which, so far as we can see, is the same throughout, and in which no different parts at all can be observed.

Many names are given to microbes according to their different shapes, but these do not matter for us; and, indeed, for some reason or other, many microbes take different shapes at different times.

YOU COULD PUT A HUNDRED MILLION MICROBES ON A NICKEL

When they are growing in one place, perhaps they are round or very short, but when they are growing in other surroundings, they may become long or thin. This is very likely a question of the kind of food they get, and it reminds us that the people who grow up in the slums are usually very short, while people who have good food and grow up in fresh air are generally many inches taller.

Considering the great things they do, the smallness of microbes is wonderful. A fair average size would be one-twenty-thousandth part of an inch across. If you took some of the little rod-like microbes and could place them end to end, nearly ten millions would be required to reach a yard, while a hundred millions would be necessary to cover a nickel in a single layer, and 640,000 billions to make a solid cubic inch. (You know that a billion is a thousand millions, do you not?)

This gives us some idea how tiny these tiniest of living things are, and we should not forget that there may be many others which are tinier still, so that we cannot even see them with microscopes, which are able to make a thing look ten thousand times as long as it really is. When a microbe has reached its full size—though that is not much to boast of—it does not stop feeding and growing, but it splits into two. Now, there must be some reason why a living

cell, which is quite strong and young, and has plenty of food, never goes on growing and growing without limit, but always after a certain point either stops growing altogether, and gets no bigger, or else splits into two cells. A great Englishman, Herbert Spencer, found out the reason.

THE WONDERFUL WAY IN WHICH ONE LIVING THING BECOMES TWO

When a thing is very tiny, it has a large amount of surface compared with the amount of stuff in it. A much larger thing has, of course, a larger surface, but as a thing gets bigger—and it does not matter in the least what you take—the size of its surface does not increase nearly so fast as the amount of stuff in it. Now, it is, of course, through its surface or its outside that a living creature gets its food, and for every living cell the time comes when its outside is not big enough, in proportion to the amount of stuff inside, for enough food to pass through it.

So, when this point is reached, a living cell must either stop growing or it must split into two cells. These two cells, you see, will have just the same amount of stuff in them that the one cell had, but they will have between them a much larger amount of surface than the one cell had, and so they will be able to get enough food to keep them going and growing. After all, it is just the same as the case of an animal like an elephant, which is very big, and must therefore have a big mouth. The surface of a living cell is its mouth, and when the inside of a cell gets too big, its surface, or mouth, does not get big enough in proportion.

WHAT WOULD HAPPEN IF THE MICROBES COULD FIND FOOD ANYWHERE

This, then, is why a living cell, like a microbe, always splits into two when it has reached a certain size, and, as this law is true of all living cells, and as all creatures are made of cells, it is one of the most important laws in the world.

The rate at which microbes grow and multiply can scarcely be believed. Starting with only one microbe, and giving it sufficient food, in only twelve hours we should have something like eighteen millions, and six hours later we should have nearly eighty thousand millions. All this would simply be the result of

taking in food, growing and dividing, and repeating the process at a tremendous rate. Of course, I do not say that this ever happened, for there would never be sufficient food, and, indeed, if microbes could get enough food to multiply as fast as they are capable of multiplying, they would soon be the only kind of living things left on the earth at all. As it is, they are like the rest of us, they cannot grow unless they get enough food of the right kind, and this is far from always being the case.

Microbes grow at rates something like this when we cultivate them on purpose, and give them the kind of food they like best; and also, unfortunately, they multiply at rates like this sometimes when they attack us, and make us ill, especially in the case of people whose bodies are just suited for microbes to grow in.

MICROBES ARE REALLY TINY PLANTS, BUT LIVE LIKE ANIMALS

But you must quite understand that not many kinds of microbes can grow in our bodies at all, and that most of them are killed at once when they enter our bodies. It is also well to remember that there are certain kinds of microbes which our bodies will kill at once, if we take care of our health and live sensibly, but which may kill us if we have been doing foolish things, and so have lessened our powers of protecting ourselves from these enemies.

The various shapes of microbes, we have said, matter very little, but what does matter a great deal is the two different kinds of ways in which microbes feed, and this we must very carefully understand. Microbes belong, on the whole, to the vegetable world, rather than the animal world, but though they are really tiny plants, none of them contain any of the green matter which enables plants to live on air as well as to breathe air. Therefore, so far as their feeding is concerned, microbes are in the same position as animals. They are all compelled, like animals, to live upon food furnished them by the bodies of other living creatures.

This is the great mark of microbes—that they live upon the bodies, either alive or dead, of other living things. These may be animal or vegetable, just as we may eat beef or bread. The great distinction between microbes is that some

of them live merely on the dead remains of living things, while others will attack and feed upon other creatures, animal or vegetable, while they are still alive.

THE MICROBES THAT PLAY A GREAT PART IN THE WORLD AND IN OUR LIVES

There are long names to describe these two kinds of microbes, but these do not matter. Those which live upon other creatures still alive are not nearly the most numerous. They include those which cause many diseases in mankind, and also attack at times other living creatures, too. But here I want especially to speak about those much more numerous microbes which live on dead matter, though always matter that has once been alive. These play a great part in the world, and, indeed, we could not possibly live without them.

Consider how many countless millions of living creatures, human, animal, and vegetable, are upon the earth, and in the air, and in the sea at this moment. For untold ages this has been so. Yet, as we know, these creatures die, and those who came before them have been dying in countless numbers every day for ages past. Now, if we consider for a moment, we shall see that, if there were no means by which the bodies of all these creatures were disposed of, the earth must long ago have been heaped up with them.

The truth is that life simply could not go on if there were not something at work which, all the time, is taking the bodies of plants and animals, as they die, and doing something to them, so that they simply disappear, and are got out of the way. But more than this, there is something at work which takes these bodies—in themselves dangerous and disagreeable—and turns them into simple materials which are used as food by the new creatures living at any time.

HOW MICROBES HELP TO KEEP THE WORLD FRESH AND YOUNG

We have already seen, in another part of this book, how microbes take the dead leaves in the autumn and turn them into stuff which can be used for making new leaves in the next spring. Microbes, then, are the wonderful power which do for the dead bodies of all living things what they do for the dead leaves. They

keep the world young and fresh and green. It has very often been said that they are scavengers, meaning that they are like the men who empty the dust-bins and keep the streets clear of all refuse. Microbes do this, it is true; but that is only the beginning of their work, and not nearly the most wonderful part of it. Far more wonderful is the way in which, living their own lives, they take things which would be disagreeable, or which, at the least, would be useless and cumber the earth, and, without noise or disturbance or any help from us, turn these things into the sources of new life.

We have to learn that there is really nothing useless in the world. Microbes are the humblest kinds of living creatures, but they are not contemptible. Without the work they do in the course of their humble and unnoticed lives, no higher form of life upon the earth, vegetable or animal or human, would be possible.

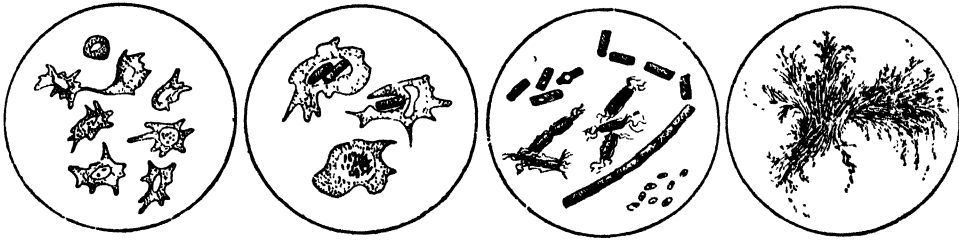
THE TINY CREATURES THAT HELP LIFE TO RENEW ITSELF FROM AGE TO AGE

Without them the earth would long ago have become simply a heaped-up graveyard, but by their aid life can go on renewing itself from year to year, and will do so for countless ages to come. Yet these wonderful little creatures, without whose aid none of us could live here, were discovered only about fifty years ago. Things may be so small that we cannot see them, but they may yet be more important than the biggest mountain on the face of the earth; and no one knows what things there may be which no one has even guessed at, but which may be just as important as anything we know.

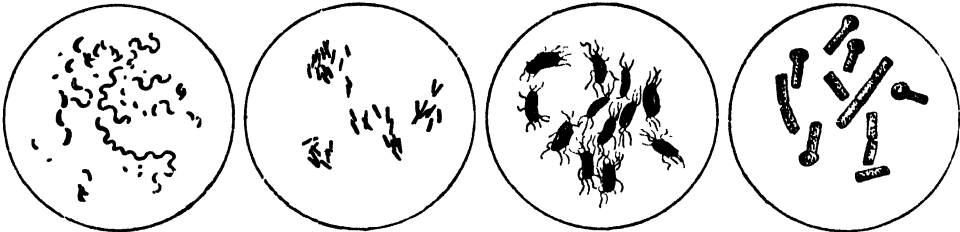
We can get some idea of the unceasing way in which these microbes are everywhere doing their work if we examine ordinary earth, and find how many microbes it contains. One grain of ordinary earth will contain anything from one thousand to three hundred thousand microbes, their number being greatest in earth in which many plants are growing. If you think of the thousands of microbes in a single grain of earth, and if you think how tiny that quantity is, you will begin to realize that it is not possible to say how many microbes there are in the world.

THE NEXT PART OF THIS IS ON PAGE 905.

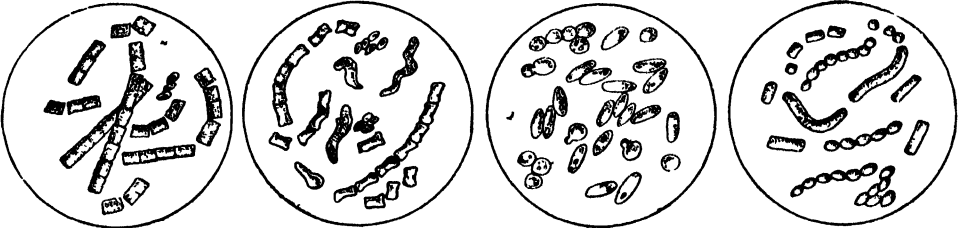
THE INVISIBLE ARMIES THAT MASTER THE EARTH



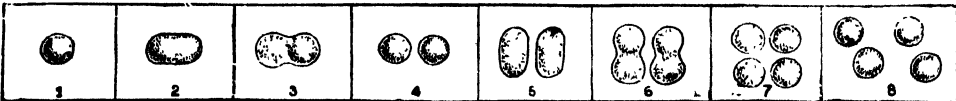
These pictures show us what is going on in our bodies almost every moment we live. Our bodies are inhabited by millions of living creatures, always fighting to make us ill or keep us well. In the first circle we see the little white things, called phagocytes, that live in our blood and keep it pure; in the second we see them devouring microbes which do us harm. The third circle shows the growth of a microbe. The small rings are the seeds, which grow together like a little stick and split up. The long, thin things that are growing out of them are the things they move with, what we should call legs and arms. The last picture shows what a colony of microbes looks like, and we see separate microbes going out to form other colonies.



This is a row of our microbe enemies, shown 1,000 times bigger than they are. The first are the microbes that cause cholera, the second cause tuberculosis, the third cause typhoid fever, and the last cause lockjaw. These powerful creatures are so small that 140,000 could be placed side by side on a line as long as a pin.



This is a row of our microbe friends, shown 1,000 times bigger than they are. The small microbes at the top in the first circle make milk sour; those below help to make butter and cream. In the second circle are the microbes found in yeast, which make alcohol; in the third is the microbe that makes vinegar; and in the last circle is a microbe that helps to make cheese. We could not live without such microbes as these.



A microbe About five After 15 It grows Both begin Both form The two At the end
beginning minutes later minutes into two to develop "waists" become four of an hour
Microbes cannot be seen without a magnifying glass, but we can watch them working with a microscope.

THE WONDERFUL WAY IN WHICH MICROBES ARE BORN WHILE WE LOOK AT THEM



These pictures show the way microbes grow. Some form a "waist" and add other microbes to themselves like a string of beads. Others form buds, which break off and become separate microbes. Others join together in long rods and break off later. And so these little creatures grow, quicker than man can count. In 24 hours, if all lived, the children of one microbe would form a line reaching hundreds of miles, and if the microbes were as big as shown here this line would be long enough to go 20 times round the earth.

KING COPHETUA AND THE BEGGAR MAID



COPHETUA SWARE A ROYAL OATH, "THIS BEGGAR MAID SHALL BE MY QUEEN."

The Book of POETRY

THE PLEASURES OF MEMORY

THE memory ought to be a storehouse, not a lumber-room, says an old writer ; and there is nothing we can store away in this magic chamber of our mind more worth having than the riches of the poets, which will outlast other possessions. "The pleasures of memory" have been sung by more than one of our poets, and though, of course, poetry is by no means the only one of these pleasures, it is one of the greatest. Here we are to see how it may best be stored in our memory.

HOW TO REMEMBER POETRY

A LITTLE girl was once asked what her memory was, and she said, "It is the thing I forget with." To how many of us, both old and young, is the memory the thing we forget with! Yet it is quite an easy matter to make it the thing we remember with. All our faculties can be made better by use. If we do not practise walking regularly, we shall in time become very poor walkers. That is so apparent that any boy or girl does not need to be told it. If we do not practise remembering, we shall in time find our memory is of little use to us. That is perhaps not so clear to everyone, and people, but especially young people, need to be told this.

It is with our brain that we remember ; our "memory" is one of the departments of the brain's work. One might think that memory could do only a certain amount of work ; that it could remember just a certain number of things ; that a time would come when, so to say, the storehouse of Memory was full. But that is not so. There is no limit to what our brain, if properly set to work, will enable us to remember. In olden times, before printing was invented, whole books, such as Homer's "Iliad," described on page 73, were carried for years in the memory of people. Most of our legends existed for ages in the memories of common people only, and were not written down in some cases until hundreds of years had passed away. Now, of all written words, none are easier to carry in our minds than poetry, and we should make a habit of "learning by heart" as many poems as possible ; not merely for the sake of remembering them, but to exercise our minds, just as we walk to exercise our legs.

CONTINUED FROM P. 718



There are many "systems" of remembering, but if we begin while young to remember what we have read, we shall not need systems ; our minds, when young and fresh, form systems for themselves without any effort on our part. But there are a few simple rules that may help us.

We must read with close *attention* to what the writer has to say, be it in prose or poetry. Secondly, we should read once in order to get a general idea of the author's story. For instance, to remember, "Lord Ullin's Daughter," we read it first in order to get the story, noting how one thing follows on another : The flight of the lovers, the pursuit by the angry father, storm on the lake, the boat overwhelmed by the waves, and the father's lament for his daughter. By noting these points we remember easily how the story proceeds.

We next read more closely still, noting the chief points of each verse, thus : (1) boatman and ferry ; (2) Highland chief and Lord Ullin's daughter ; (4) horsemen, bonnie bride, and so forth. Finally, we have the actual words to remember, and this we do, first, by noting the rhythm (see page 711) and the rhyme (see page 101) ; secondly, by emphasizing in our minds the "picture words" as we call the particular words in each verse that raise up a picture before our minds. In the second verse of this poem the picture words are "stormy water" ; in the third, "glen" and "heather." These words suggest "pictures" to us at once, and help us to recall the verse more easily. Of course, we must read the poem many times before we have it "by heart," and it should be read aloud as often as possible.

THE BEGGAR MAID

The legend of King Cophetua and the Beggar Maid is very old, and is mentioned by Shakespeare in several of his plays. Tennyson tells it perfectly in the space of sixteen lines.

HER arms across her breast she laid ;
She was more fair than words can say :
Bare-footed came the beggar maid
Before the king Cophetua.
In robe and crown the king stepped down,
To meet and greet her on her way ;
" It is no wonder," said the lords,
" She is more beautiful than day."

As shines the moon in clouded skies,
She in her poor attire was seen ;
One praised her ankles, one her eyes,
One her dark hair and lonesome mien.
So sweet a face, such angel grace,
In all that land had never been.
Cophetua sware a royal oath :
" This beggar maid shall be my queen ! "

LULLABY OF AN INFANT CHIEF

This tiny poem, by the great Sir Walter Scott, takes us back to the days of old warfare, the days of old romance, about which Sir Walter loved to write in his great books.

OH, hush thee, my baby ! thy sire was a knight,
Thy mother a lady, both lovely and bright ;
The woods and the glens, from the towers
which we see,
They all are belonging, dear baby, to thee.

Oh, fear not the bugle, though loudly it blows !
It calls but the warders that guard thy repose ;
Their bows would be bended, their blades
would be red,
Ere the step of a foeman draws near to thy bed.

Oh, hush thee, my baby ! the time will soon come
When thy sleep shall be broken by trumpet
and drum ;
Then hush thee, my darling ! take rest while
you may,
For strife comes with manhood, and waking
with day.

MY MOTHER

This children's poem has long been a favorite, expressing what each of us must feel about our mother's love. It was written by Jane Taylor, who wrote " The Star," on p. 1156.

WHO fed me from her gentle breast,
And hush'd me in her arms to rest,
And on my cheeks sweet kisses prest ?
My Mother.

When sleep forsook my open eye,
Who was it sang sweet hushaby
And rock'd me that I should not cry ?
My Mother.

Who sat and watched my infant head
When sleeping on my cradle bed,
And tears of sweet affection shed ?
My Mother.

When pain and sickness made me cry,
Who gaz'd upon my heavy eye,
And wept, for fear that I should die ?
My Mother.

Who drest my doll in clothes so gay,
And taught me pretty how to play,
And minded all I had to say ?
My Mother.

Who ran to help me when I fell,
And would some pretty story tell,
Or kiss the place to make it well ?
My Mother.

Who taught my infant lips to pray,
And love God's holy book and day,
And walk in wisdom's pleasant way ?
My Mother.

And can I ever cease to be
Affectionate and kind to thee,
Who wast so very kind to me,
My Mother.

Ah ! no, the thought I cannot bear,
And if God please my life to spare,
I hope I shall reward thy care,
My Mother.

When thou art feeble, old, and grey,
My healthy arm shall be thy stay,
And I will soothe thy pains away,
My Mother.

And when I see thee hang thy head,
'Twill be my turn to watch thy bed,
And tears of sweet affection shed,
My Mother.

WEE WILLIE WINKIE

This famous Scotch nursery song was written by a Glasgow working man, named William Miller, who died in 1872. " Willie Winkie " is known to some children as " The Sandman," who comes to make the children sleepy.

WEE Willie Winkie rins through the town,
Upstairs and downstairs in his night-
gown ;
Tirling at the window, crying at the lock,
" Are the weans in their bed, for it's now ten
o'clock ? "

Hey, Willie Winkie, are ye coming ben ?
The cat's singing grey thrums, to the sleeping
hen ;
The dog's spelder'd on the floor, and doesna'
gie a cheep,
But here's a waukrife laddie that winna' fa'
asleep.

Anything but sleep, you rogue ! Glow'ring
like the moon,
Rattling in an aim jug wi' an aim spoon ;
Rumblin', tumblin', round about, crawling like
a cock,
Skirlin' like a kenna-what, wauk'nin' sleep-
ing folk.

Hey, Willie Winkie, the wean's in a creel !
Wamblin's aff a body's knee like a very eel,
Ruggin' at the cat's lug, rav'llin' a' her
thrums—
Hey, Willie Winkie—see, there he comes !

Weared is the mither that has a stoorie wean,
A wee stumpee stousie, that canna rin his lane,
That has a battle aye wi' sleep, before he'll
close an e'e—
But a kiss frae aff his rosy lips gies strength
anew to me.

"OH, I'M THE CHIEF OF ULVA'S ISLE, AND THIS, LORD ULLIN'S DAUGHTER!"



LORD ULLIN'S DAUGHTER

This is one of the best known of Thomas Campbell's poems in which an old Highland story is told in the simple, straightforward style of the ballad. A ballad is usually a romantic story in verse, but it may be humorous. This one is tragic in the highest sense, and gives a stirring picture of a Scottish loch, or lake, during a great storm. In olden days people thought evil spirits lived in the lakes, and the scream of the storm was the evil spirit, or "water-wraith," mentioned in the seventh verse, delighting in its work.

A CHIEFTAIN to the Highlands bound
Cries: "Boatman, do not tarry!
And I'll give thee a silver pound
To row us o'er the ferry!"

"Now who be ye, would cross Lochgyle,
This dark and stormy water?"

"Oh, I'm the chief of Ulva's isle,
And this, Lord Ullin's daughter!"

"And fast before her father's men
Three days we've fled together,
For should he find us in the glen
My blood would stain the heather.

"His horsemen hard behind us ride—
Should they our steps discover,
Then who will cheer my bonnie bride
When they have slain her lover?"

Out spoke the hardy Highland wight,
"I'll go, my chief, I'm ready!
It is not for your silver bright,
But for your winsome lady:

"And, by my word, the bonny bird
In danger shall not tarry;
So though the waves are raging white,
I'll row you o'er the ferry."

By this the storm grew loud apace,
The water-wraith was shrieking;
And in the scowl of heaven each face
Grew dark as they were speaking.

But still as wilder blew the wind,
And as the night grew drearer,
Adown the glen rode armed men,
Their trampling sounded nearer.

"Oh, haste thee, haste!" the lady cries,
"Though tempests round us gather;
I'll meet the raging of the skies,
But not an angry father."

The boat has left a stormy land,
A stormy sea before her—
When, oh, too strong for human hand
The tempest gathered o'er her!

And still they rowed amidst the roar
Of waters fast prevailing;
Lord Ullin reached that fatal shore—
His wrath was changed to wailing:

For, sore dismayed, through storm and shade
His child he did discover;
One lovely hand she stretched for aid,
And one was round her lover.

"Come back! come back!" he cried in grief,
"Across this stormy water;
And I'll forgive your Highland chief—
My daughter—O my daughter!"

'Twas vain: the loud waves lashed the shore,
Return or aid preventing;
The waters wild went o'er his child,
And he was left lamenting.

BANNOCKBURN

Every country has its national songs, in which the heroic spirit of its people is expressed and its great deeds remembered. Scotland is rich in these songs, and perhaps the most famous celebrates the heroism of the Scots at the battle of Bannockburn, where they defeated the English. It was written by Robert Burns, a great Scottish poet.

SCOTS, wha hae wi' Wallace bled—
Scots, wham Bruce has aften led—
Welcome to your gory bed,
Or to victorie!

Now's the day, and now's the hour:
See the front o' battle lower;
See approach proud Edward's power—
Chains and slavery!

Wha will be a traitor knave?
Wha can fill a coward's grave?
Wha sae base as a slave?
Let him turn and flee!

Wha for Scotland's king and law
Freedom's sword will strongly draw,
Freeman stand or freeman fa'—
Let him on wi' me!

By oppression's woes and pains!
By your sons in servile chains!
We will drain our dearest veins,
But they shall be free!

Lay the proud usurpers low!
Tyrants fall in every foe!
Liberty's in every blow!
Let us do, or die!

PICTURES IN THE FIRE

On page 103 we read R. L. Stevenson's fanciful verses about "Armies in the Fire." Here is Adelaide Anne Proctor's poem with the same fancy, but which gives us an ever-changing series of the pictures we may see in the fire. It is more sentimental than Stevenson's, and not quite so simple.

WHAT is it you ask me, darling?
All my stories, child, you know;
I have no strange dreams to tell you,
Pictures I have none to show.

Tell your glorious scenes of travel?
Nay, my child, that cannot be;
I have seen no foreign countries,
Marvels none on land or sea.

Yet strange sights in truth I witness,
And I gaze until I tire;
Wondrous pictures, changing ever,
As I look into the fire.

There, last night, I saw a cavern,
Black as pitch; within it lay
Coiled in many folds a dragon,
Glaring as if turned at bay.

And a knight in dismal armour
On a winged eagle came,
To do battle with this dragon;
And his crest was all of flame.

As I gazed the dragon faded,
And, instead, sat Pluto crowned,
By a lake of burning fire;
Spirits dark were crouching round.

That was gone, and lo! before me,
A cathedral vast and grim;
I could almost hear the organ
Peal along the arches dim.

As I watched the wreathed pillars,
Groves of stately palms arose,
And a group of swarthy Indians
Stealing on some sleepy foes.

Stay; a cataract glancing brightly,
Dashed and sparkled; and beside
Lay a broken marble monster,
Mouth and eyes were staring wide.

Then I saw a maiden wreathing
Starry flowers in garden sweet;
Did she see the fiery serpent
That was wrapped about her feet?

That fell crashing all and vanished;
And I saw two armies close—
I could almost hear the clarions,
And the shouting of the foes.

They were gone, and lo! bright angels,
On a barren mountain wild,
Raised appealing arms to Heaven,
Bearing up a little child.

And I gazed, and gazed, and slowly
Gathered in my eyes sad tears,
And the fiery pictures bore me
Back through distant dreams of years.

Once again I tasted sorrow,
With past joy was once more gay,
Till the shade had gathered round me—
And the fire had died away.

WHAT EVERYONE KNOWS

COCKS crow in the morn
To tell us to rise,
And he who lies late
Will never be wise;
For early to bed,
And early to rise,
Is the way to be healthy,
And wealthy, and wise.

THE WORLD

William Brighty Rands, the author of this poem, wrote much charming verse of a light, humorous kind. In "The World" there is a touch of humor, but it has the common-sense which asks us to remember that, though we may be insignificant in size compared with Nature, we have the power to triumph over Nature. We have brain—but we must use it.

GREAT, wide, beautiful, wonderful world,
With the wonderful water round you
curled,
And the wonderful grass upon your breast—
World, you are beautifully drest.

The wonderful air is over me,
And the wonderful wind is shaking the tree,
It walks on the water and whirls the mills,
And talks to itself on the tops of the hills.

You friendly Earth! how far you go,
With the wheat-fields that nod and the
rivers that flow,
With cities and gardens, and cliffs and isles,
And people upon you for thousands of miles!

Ah! you are so great, and I am so small,
I tremble to think of you, World, at all;
And yet when I said my prayers to-day,
A whisper inside me seemed to say:
"You are more than the Earth, though you
are such a dot;
You can love and think, and the Earth
cannot!"

LITTLE VERSES FOR VERY LITTLE PEOPLE

HI! diddle diddle,
The cat and the fiddle,
The cow jumped over the moon;
The little dog laughed
To see such sport,
While the dish ran after the spoon.

SING, sing, what shall I sing?
The cat has eaten the pudding-string!
Do, do, what shall I do?
The cat has bitten it quite in two.

WHO comes here?
A grenadier.
What do you want?
A pot of beer.
Where is your money?
I have none.
Then, grenadier,
Get you gone.



THIRTY days hath September,
April, June, and November;
February has twenty-eight alone.
All the rest have thirty-one;
Excepting leap-year, that's the time
When February's days are twenty-nine.

LITTLE Tom Tucker
Sings for his supper;
What shall he eat?
White bread and butter.
How shall he cut it
Without a knife?
How can he marry
Without a wife?

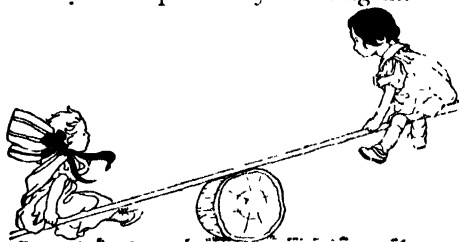
YOUNG lambs to sell!
Young lambs to sell!
If I'd as much money as I could tell,
I never would cry—Young lambs to sell!

LITTLE Nanny Etticoat,
In a white petticoat,
And a red nose;
The longer she stands
The shorter she grows.



PETER PIPER picked a peck of
pickled pepper;
A peck of pickled pepper Peter Piper
picked;
If Peter Piper picked a peck of pickled
pepper,
Where's the peck of pickled pepper
Peter Piper picked?

BYE, Baby Bunting,
Daddy's gone a-hunting
To get a little rabbit-skin
To wrap a Baby Bunting in.

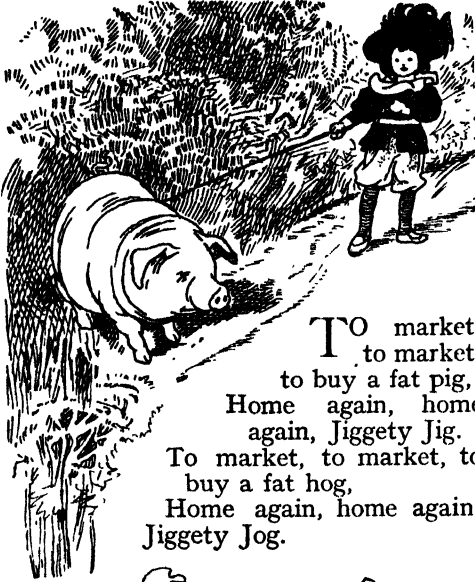


SEE-SAW, Margery Daw,
Baby shall have a new master;
She shall have but a penny a day,
Because she can't work any faster.

SEE-SAW, MARGERY DAW

See - saw, Mar - ge - ry Daw, Ba - by shall have a new mas - ter ;

She shall have but a pen - ny a day, Be - cause she can't work an - y fast - er.



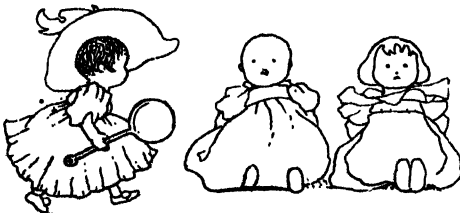
TO market,
to market,
to buy a fat pig,
Home again, home
again, Jiggety Jig.
To market, to market, to
buy a fat hog,
Home again, home again,
Jiggety Jog.

THERE
were
two
black-
birds,
Sitting on
a hill,
The one
named
Jack,

The other named Jill;
Fly away, Jack! Fly away, Jill!
Come again, Jack! Come again, Jill!



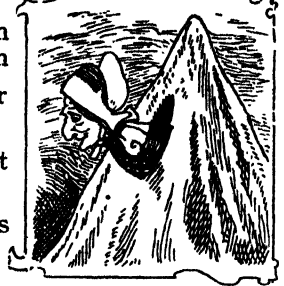
ROBIN and Richard were two pretty
men;
They lay in bed till the clock struck ten;
Then up starts Robin and looks at the
sky,
Oh, brother Richard, the sun's very high!
You go on with bottle and bag,
And I'll follow after on jolly Jack Nag.



COME, let's to bed,
Says Sleepy-head,
Tarry a while, says Slow,
Put on the pan, says Greedy Nan,
Let's sup before we go.

THERE was an
old woman
Lived under
a hill;

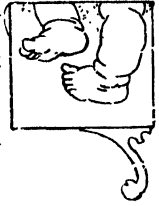
And if she's not
gone,
She lives
there still.



LITTLE Jack Horner sat in a corner
Eating a Christmas pie;
He put in his thumb, and he took out
a plum,
And said, "What a good boy am I!"

THIS little pig went to market.

This little pig stayed
at home,
This little pig got roast
beef,
This little pig got none;
This little pig cried
"Wee, wee!"
all the way home.



FOUR and twenty tailors went to kill a
snail,
The best man amongst them durst not
touch her tail;
She put out her horns like a little Kyloe
cow,
Run, tailors, run, or she'll kill you all
e'en now.

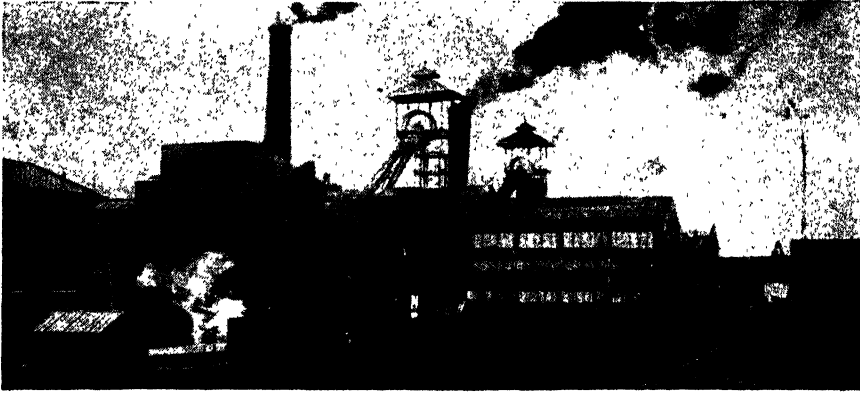


HERE am I, little
Jumping Joan,
When nobody's with
me
I'm always alone.

MATTHEW, Mark, Luke and John,
Guard the bed that I lie on!
Four corners to my bed,
Four angels round my head—
One to watch, one to pray,
And two to bear my soul away.



The Book of FAMILIAR THINGS



HOW WE DIG UP SUNSHINE THE STORY OF A PIECE OF COAL

POETS have sometimes called coal buried sunshine; and they are quite right, for coal is really sunshine that has been buried down in the earth for millions of years. Long, long ago, before there were any women and men and children on the earth, ferns grew as big as small trees, tall and strong and thick. The sun poured down on them all day long, and the ferns drank in the sunshine as it came to them and used it to make green leaves and stems.

This went on for a very long time, until at last ferns of that kind came to an end altogether, and their dead leaves and branches were buried. Down in the earth the bodies of these ferns began to change into something rich and strange. Sometimes, in some parts of the world, we can see the change going on still. There are places, in Scotland and Ireland and other regions where the bodies of these ferns have turned into stuff called peat, a sort of soft, wet wood, which forms great bogs, or places of wet, soft, spongy ground, where it is unpleasant to walk.

That is how the ferns changed when they were not buried. But in most parts of the world they were buried deep down in the earth, and they

CONTINUED FROM 753



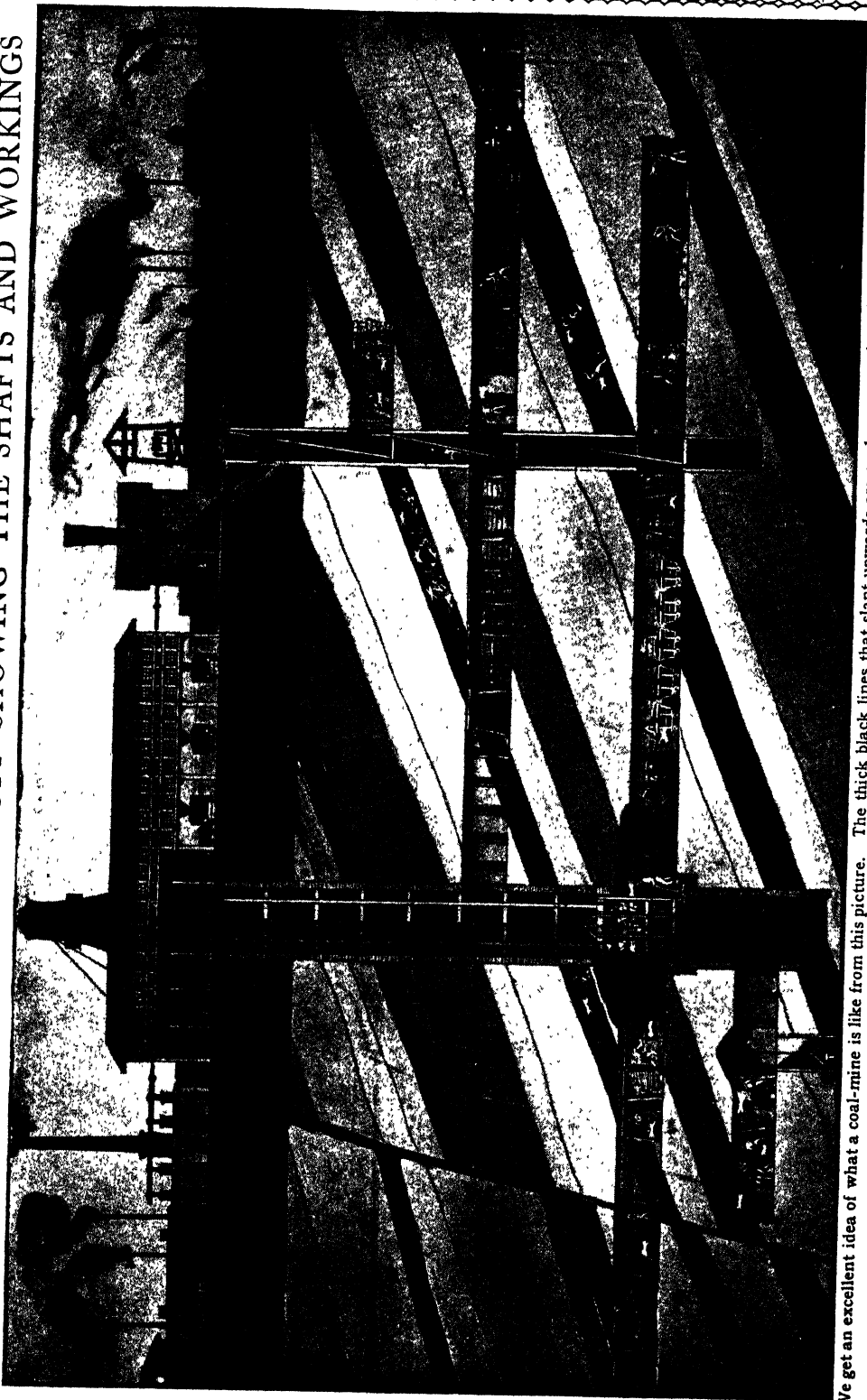
changed first into peat, and then into something hard and black, which we call coal.

For ages and ages this coal has lain in the earth. After the ferns had passed, great forests of trees grew and disappeared again. The waves of the sea crept slowly up to the forests as thousands and thousands of years went by, and the sea washed away the trees. For ages and ages these trees lay at the bottom of the sea, until the waves crept farther and farther across the earth and left the places dry again.

Then the wind blew the dust across the earth. Great pieces of rock fell and were covered up with new soil. Again and again this happened. In one place in England the sea and the land changed places sixteen times, and every time the sea swept away a great forest of trees, which had been drinking in sunshine for thousands of years until they were buried in the earth and turned to coal. Deep down in the earth lies the sunshine, locked up in the green leaves of the ferns and trees which have now become coal.

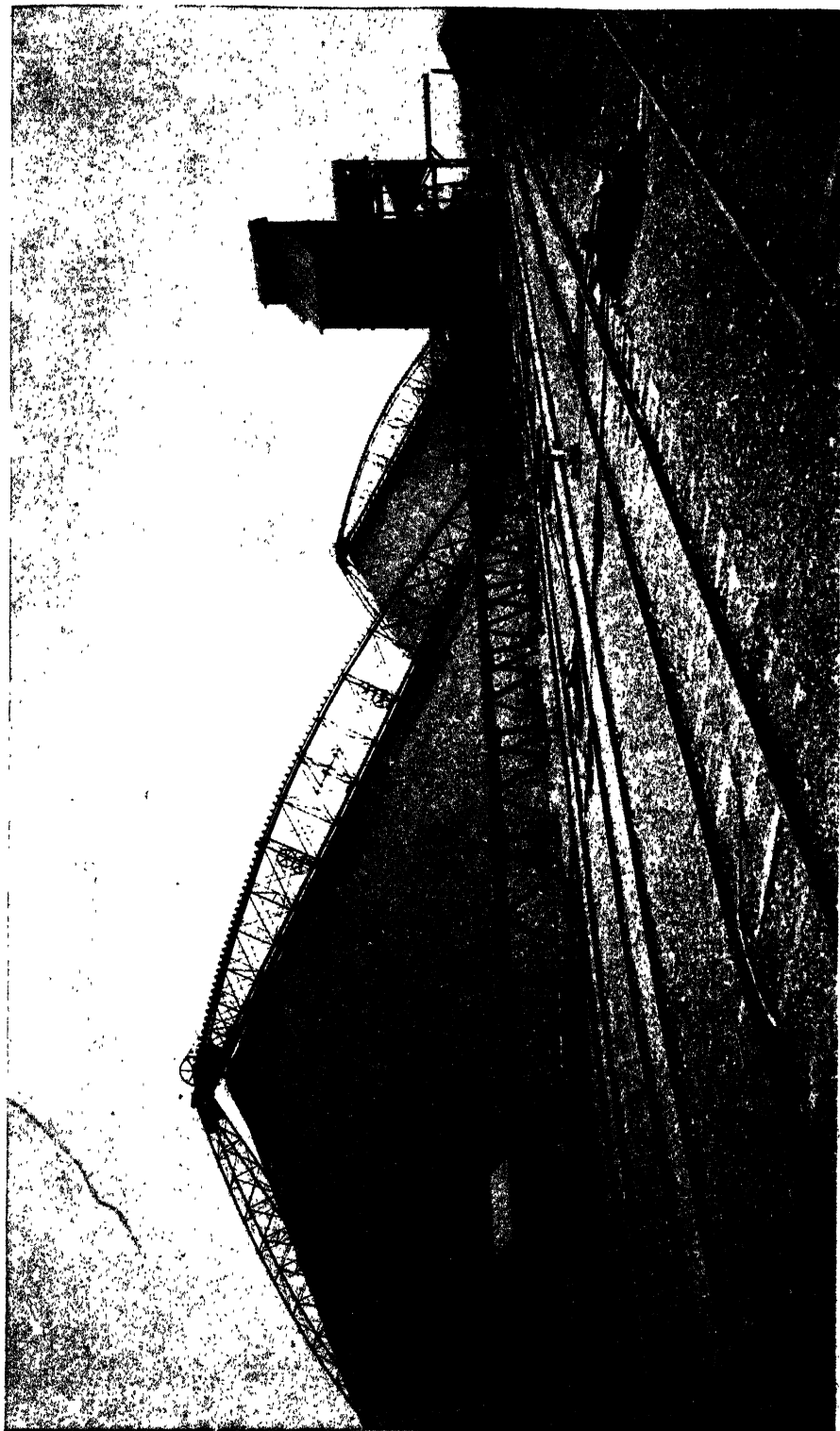
Coal has for hundreds of years been one of the most important minerals. Our manufactures could not be carried on without the power the heat from coal gives us. The sunshine released

A COAL-MINE WITH THE LID OFF SHOWING THE SHAFTS AND WORKINGS



We get an excellent idea of what a coal-mine is like from this picture. The thick black lines that slant upwards are coal-seams, and roadways lead from the shafts to these.

A MOUNTAIN OF COAL STORED BY THE RAILROAD



Very often the railroads cannot carry away coal as fast as it is brought to the surface: there is not sufficient room in the cities to store the immense amount needed. Here we see small mountains of coal stored beside the tracks until it is needed. Fortunately coal is not injured by the rain or the snow which may fall upon it.

by burning the coal cooks our dinner and drives the machines that make the cloth for our clothes ; it carries the great ships across the sea, and the trains across the land. Is it not wonderful, then, that men should have been so stupid as to declare that no coal should be burnt as fuel ?

The Romans, when they were in Britain, were wise enough to use coal, but kings who lived hundreds of years later gave orders that no coal should be used. Henry III., who was King of England from 1216 until 1272, gave the people of Newcastle the right to sell coal, and people engaged in trade began to use it. But the wealthy people complained of the smoke, so the king issued an order saying that nothing but wood should be used for fires. Edward II. was wiser. He restored the rights of the people of Newcastle to sell coal, and gave permission to the owners of coalfields in Derbyshire also to sell.

The fortunes of coal varied from reign to reign. Sometimes it was in favor, but more often it was in disgrace.

Wood was dear, and always getting more scarce, of course ; but, when coal was in disgrace, the people, rich and poor alike, had to burn wood or go without fires. Even Queen Elizabeth could not overcome the old notion that coal was dangerous to health. Most of her members of Parliament were country gentlemen. In their own homes in the country they naturally used wood, which was to be got without trouble. The queen thought, therefore, that, as they were used to wood fires, the smoke from the coal fires would damage their health. So, during the time that these gentlemen were in London for the meetings of Parliament, no one was permitted to burn coal.

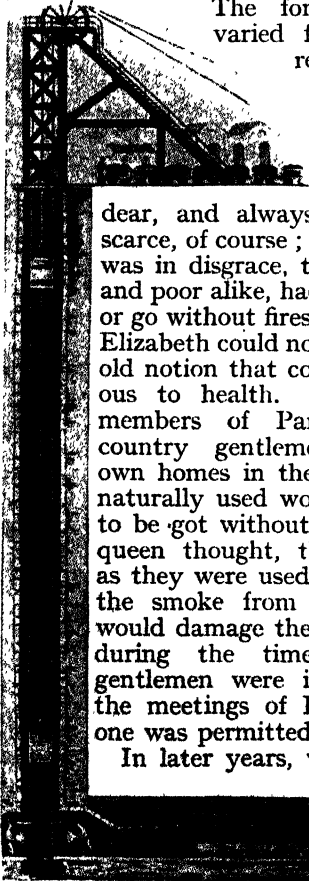
In later years, when coal was

regarded as necessary, the greater part of the coal going to London was brought down the coast by sea, and all that went up the Thames was taxed. But Oliver Cromwell had many cargoes of coal carried in free from tax, so that the poor might get it cheaply. Also, he made the city companies store coal in the summer, when it was cheap, for the use of the poor in winter. It would be a blessing to the poor if men who have the power would do something of the same sort nowadays.

It is not a simple task to get the coal. The pictures in the following pages show us how it comes to us.

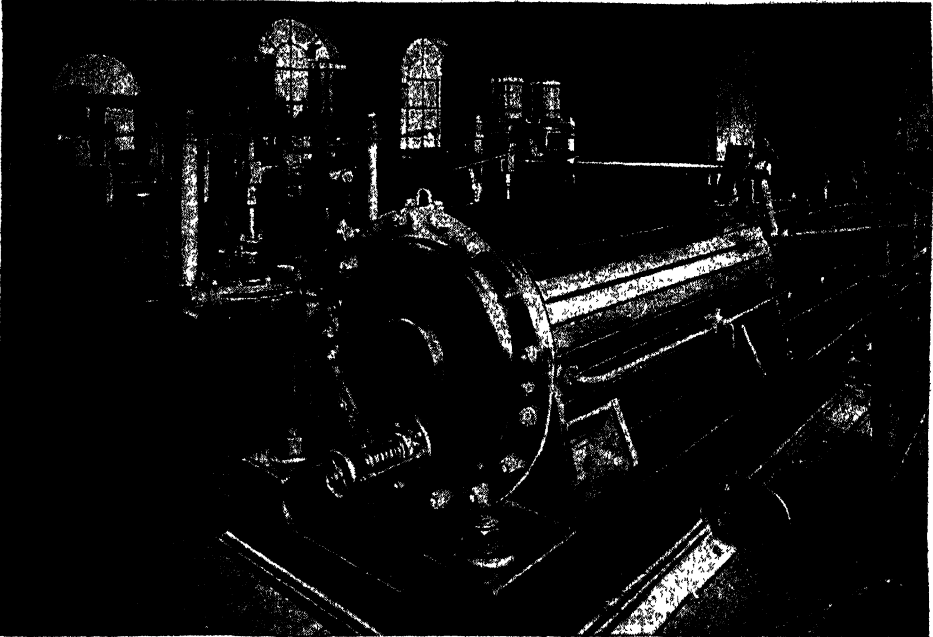
We dig great holes called shafts in the earth, deep, deep down—longer, perhaps, than the street you live in, and send men down in great wooden cages with picks and shovels to take out the coal for us. All day long they work, with tiny lamps to light the way, and they dig into the coal walls all round them, making long, narrow roads, like tunnels. As the coal is dug out, it is put into little trucks, which run along little railways to the bottom of the shaft. There are very few steam-engines down the pit to pull these trucks, because the only fire usually allowed is the light in the lamp, which must generally be covered with gauze, so that the gas that comes out of the coal shall not catch fire and set the pit in a blaze. And, as there are no steam-engines, the miners take down with them in the great wooden cage good, patient mules, which kick and neigh as they go down, but draw the wagons along like the brave and gentle animals that they are. Sometimes electric cars are used.

When a truck of coal reaches the bottom of the shaft, it is fastened to a long chain, which pulls it up to the top, where it is put in a car on the railway and carried all over the land to help to make gas and steam. When we light gas or fire, the sunshine which has been buried in the earth streams out again, filling our homes with light and warmth exactly like the light and warmth the ferns and the forests received from the sun ages ago ; and this is why the poets are right when they call coal buried sunshine.



This is a picture of a coal-mine, showing how the coal is dug out of the earth, how it is drawn in little wagons to the bottom of the shaft, and how it comes up to the top, where the train is waiting for it.

HOW MINERS GO DOWN IN THE EARTH

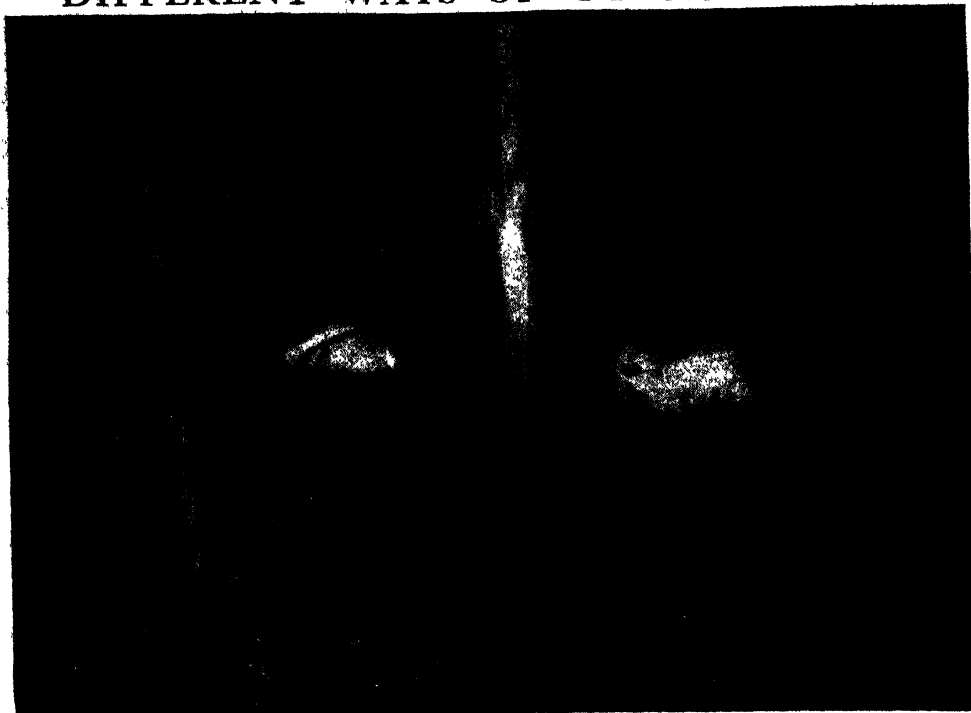


A very important part of a coal-mine is the engine-house with its engine, which turns a drum or great reel of steel wire and lets the cages up and down the shaft, so that the miners may reach the coal and send it up.



The miners start work by entering the cage, as shown here, ready to go down the shaft to the coal underground. A brake prevents the engine in our first picture from moving the cage up or down too quickly.

DIFFERENT WAYS OF GETTING COAL

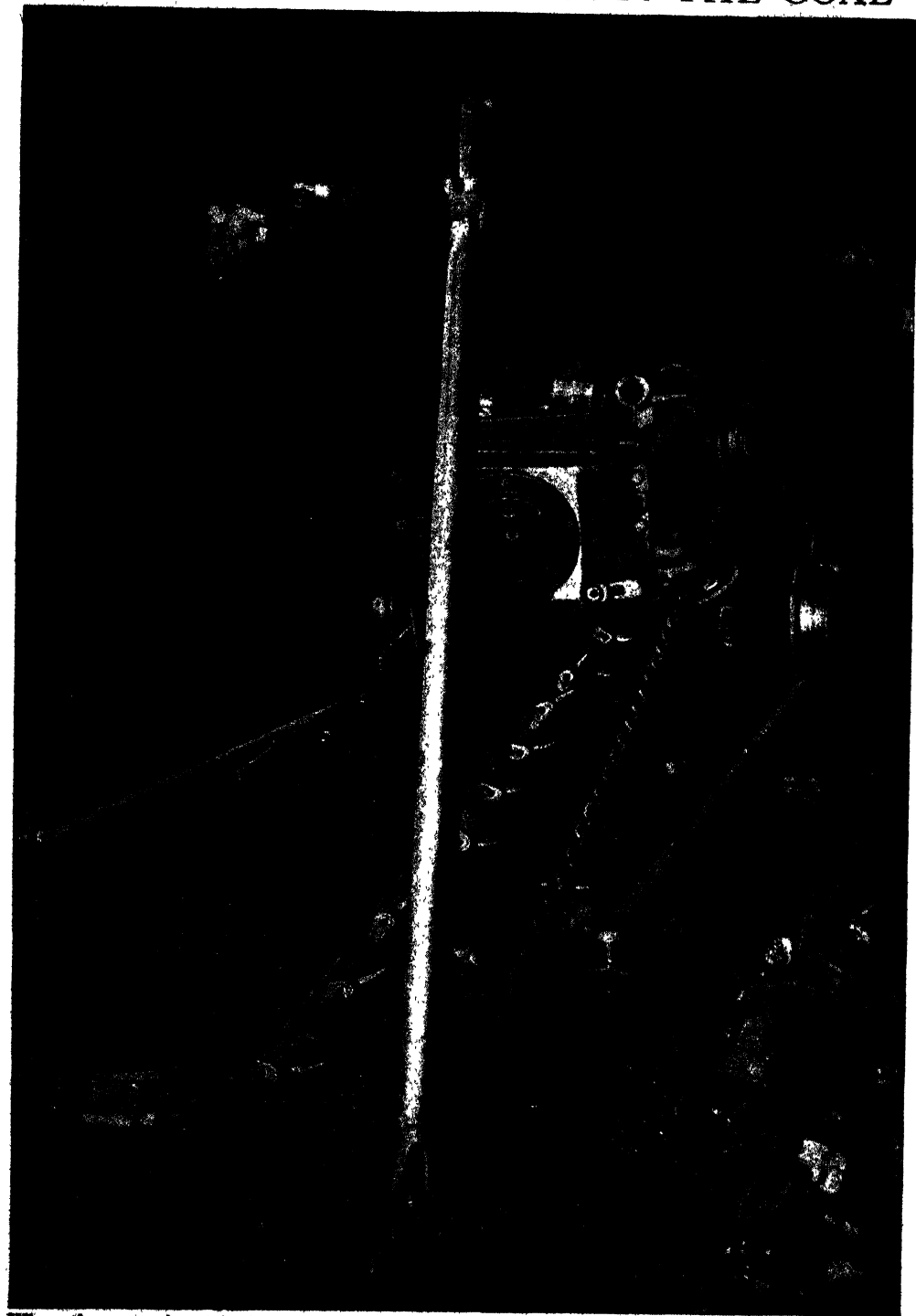


The miners work lying on their sides or backs and loosen the coal with little pickaxes. Owing to the heat they wear very few clothes. For light they use safety lamps like that which we saw on page 664.



Here you see men getting out coal by means of the machine shown on another page. Where the seam is thick enough it is used to cut a groove under the wall of coal. A few holes are then drilled in the coal, small charges of powder are exploded, and the whole wall is broken down ready to be loaded into cars and taken out of the mine. One of these machines does as much work as dozens of men.

THE MACHINE WHICH CUTS THE COAL



Where the seam of coal is thin men work as shown on the other page, but this machine makes mining easier. It is run on rails up to a solid wall of coal. The teeth which you see are on an endless chain and go round the projecting arm. The whole wall of coal is undercut, and can easily be broken down. Picture, Press Illustrating Service, Inc.

PONIES THAT LIVE BELOW THE GROUND



Thousands of ponies in England, or mules in this country, live in darkness. They pull the trucks along the underground roadways, and stables are built in the mine so that they need not go up and down the shaft.

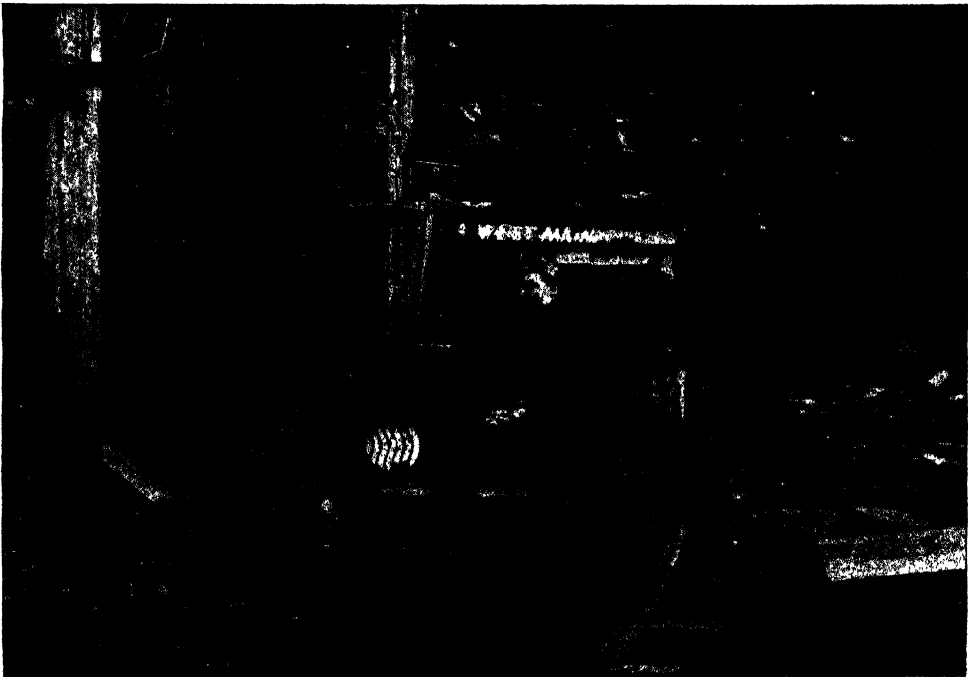


The mine ponies are patient, hard-working animals, and, although living in such unfavorable conditions, are strong and can pull a train of heavily-laden trucks. This is possible because the wagons run on rails.

COAL ON ITS WAY TO THE FURNACE



As the miners go further and further from the entrance, tracks are built after them. When the coal is broken down it is loaded into the cars which are then run upon scales so that the weight each miner has produced can be known. Miners are usually paid a fixed sum for every ton they send to the surface.



In the old days the cars of coal were drawn by ponies or mules, and thousands of these patient animals are still deep down in the mines. In the larger and better mines electric engines draw long trains of loaded cars. Here we see one of them coming out of the mine in the side of a mountain, for not all mines are sunk deep into the earth. Sometimes the entrance is by a sloping way, and sometimes by a tunnel.

THE COAL-MINER COMES BACK TO THE LIGHT



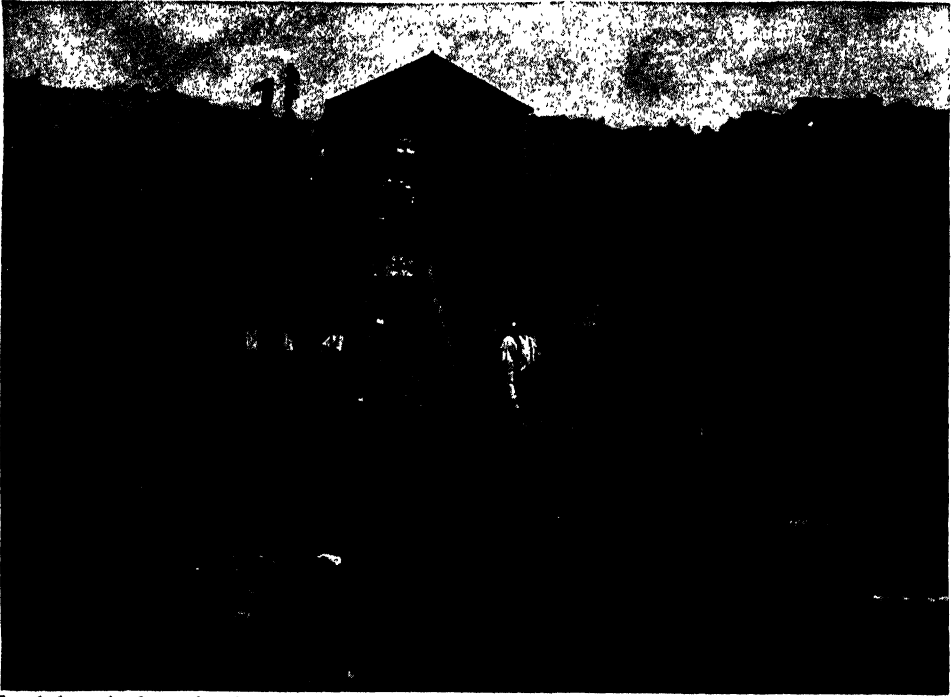
The miner spends most of his working life out of the light of the sun, and out of the real world. His calling is a dangerous one, and when the men go down to their daily work they take their lives in their hands. A gas called fire-damp forms in the mine, and if this meets an exposed light it explodes, setting the mine on fire and imprisoning the men by blocking up the passages with fallen coal. Naturally, therefore, when the men arrive safely at the top, after their day's work, their families are very glad to see them.

WHERE THE COAL IS SEPARATED IN DIFFERENT SIZES



This is the immense Diamond Breaker of the Delaware, Lackawanna and Western Railroad at Scranton, Pennsylvania. The coal comes from the mines through the long covered way. Inside the building are many screens with openings of different sizes, which separate the coal into the kinds we know. Slate and other impurities are picked out, and the coal finally passes down to the cars on the railroad tracks. Then it may go to an ocean steamer or to a country village.

HOW THE COAL DROPS INTO THE TRUCKS



Loaded trucks from the pit's mouth ascend to the tippie, on the left-hand rails, and the empty wagons return by the right-hand track, as seen here. The coal is sifted into various sizes by falling over screens.



The tippie is built over the railway, and as the coal is sorted it is shot into cars waiting to receive it underneath. Then the cars are joined together to form a train, and the coal is taken all over the country.

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LOADS OF SUNSHINE FOR OUR HOMES



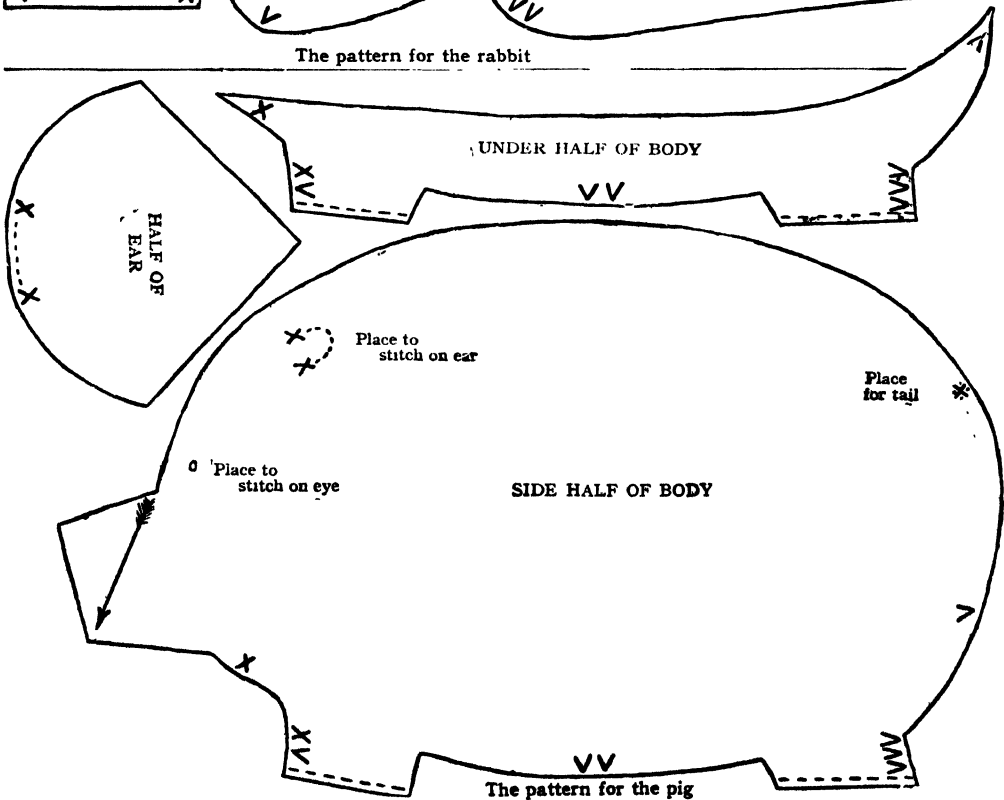
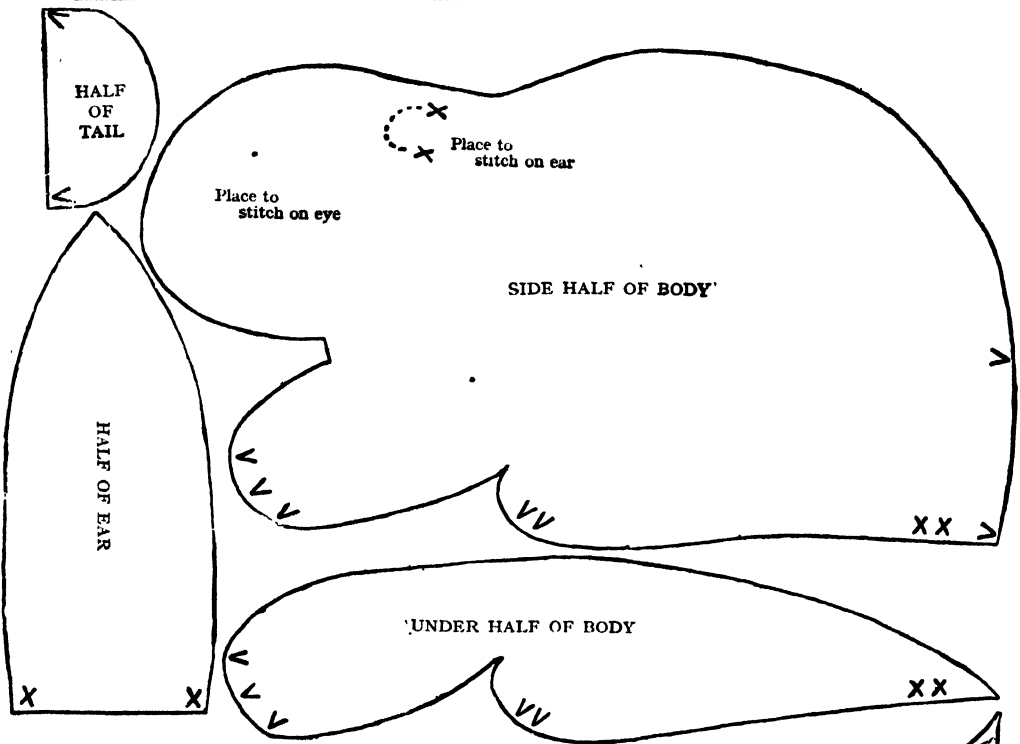
In the slippery city streets horses pulling the heavy coal wagons often fall, and break their legs. A motor truck like this can do more work than a dozen horses, and do it more quickly and better.



And at last we sit round the fire enjoying the sunshine that was buried in the earth millions of years ago. Coal fires are so good that it seems strange to us that they should once have been forbidden

THE NEXT PICTURES OF FAMILIAR THINGS ARE ON PAGE 943.

THE PLANS FOR MAKING A TOY ZOO



These patterns can be easily traced on thin paper, which can be then used for cutting out.

THINGS TO MAKE AND THINGS TO DO

WHAT THESE PAGES TEACH US

IN these pages are instructions for the making of two more animals for our toy Zoo, which began on page 619. Those of us who have our own little garden also learn what we can do in the garden at the end of May. Those of us who are building Modeltown find here plans and instructions for making a villa. Another conjuring trick for boys, another little doll's garment for girls, as well as some more problems for clever people, also come into this part of our book.

CONTINUED FROM PAGE 735.

A RABBIT AND A PIG FOR OUR TOY ZOO

THE rabbit and the pig are both made of swansdown calico; a quarter of a yard of the best, unbleached, at about 25 cents a yard will be more than enough for the two. Piggie has legs of hat-wire.

The rabbit is so simple to make that anyone who made the cat shown in our first article will scarcely need any explanation of the pattern. Two pieces to face each other must be cut of each part shown except the ears, and of these the under halves are of pink satin or inch-wide satin ribbon. The neatest way to sew on a rabbit's ear is to cut a slit, as shown below, in the stuff on each side of the head after the animal is stitched, and before it is filled. The point should be towards the tail.

The two sides of the ear should be folded towards the middle, to make it small at the root, and secured with a stitch or two. Then poke the ear through the slit so that the three-cornered flap made by the cut goes in along with it to the other side. Look inside to see what you are doing, and when about a quarter of an inch of the ear is well through, fasten it down on the wrong side. Then hem it neatly round on the right side also, fasten off so that the ear will fall over the fastening to hide it, fluff out the nap all round where the ear is joined to the head, and it will look almost as if it grew there! If you are making the ears to stand up, do just the same, only make the point of the slit incline upwards instead of towards the tail. The tail should be sewn up and turned before the back seam of the body is quite finished, so that it can be inserted and sewn in with the seam. It is impossible to make it look neat if sewn on after the rest of the rabbit is finished. Bunny has a pink or fawn-

colored worsted nose, as shown here, made by big stitches of colored cotton, and bead eyes. All the seams should have the nap carefully fluffed up, to hide the stitches.

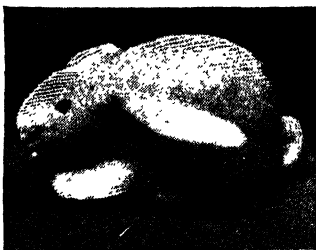
Now we are going to make our pig. Leave the piece where the dots are in the pattern open when all the rest is stitched up for the openings where his legs are to be

fixed in. After piggy is stuffed, a stitch or two of double thread sent through in the direction of the arrow in the pattern will wrinkle it up into such a natural expression that you can almost hear him grunt! The pink-lined ears are turned downwards, towards the face, so the point of the V-shaped slit should be turned in the same direction; they are

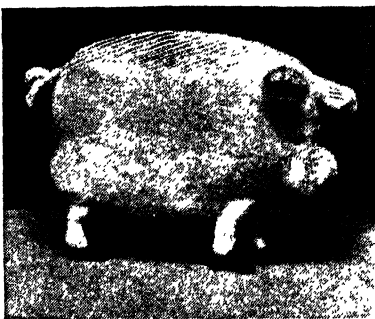
folded over and inserted in the same way as those of the rabbit. Piggy's legs will each need a piece of bonnet-wire about three inches long, doubled, and bent as shown here. All except the bent part must be sewn up in a piece of material turned in at the lower end, and turned under—as it would

fray otherwise where you sew it up. The loop of wire must be covered with Dennison's or Le Page's glue, which most stationery shops keep in stock. This becomes soft when you warm it. Put a dab on the loop of wire, and quickly mold it all round the wire with a wet finger and thumb. If you press your thumb-nail into the groove between the double wire, you can imitate piggy's cloven

"trotter." The legs are poked up into the body after it is stuffed, until only $\frac{1}{2}$ an inch, in addition to the foot, can be seen. Turn in the raw edges of the leg-holes which were left, and hem them down on the legs. His eyes are made of two black beads. A bit of white worsted, crocheted up to a piece of chain, can be sewn on to form piggy's tail.



The rabbit for our toy Zoo



The pig for our toy Zoo

A LITTLE GARDEN MONTH BY MONTH

WHAT TO DO AT THE END OF MAY

THIS is about the busiest time in the whole year where there are many plants to put out that have had protection through the winter.

We will suppose that our geraniums and fuchsias have by this time become thoroughly hardened by standing out in the open; therefore, they may be taken from their pots now, and planted out for the summer months in the garden plot.

If the geraniums are what are called *ivy-leaved* geraniums (with smooth, glossy leaves) they may be treated in one of two ways—the

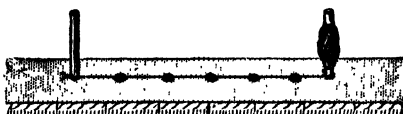
growths may be pegged down to the soil, or they may be lifted and tied up to stakes—it depends whether we wish to make use of them as tall or as dwarf plants. These ivy-leaved geraniums are also splendid to treat as hanging plants. Wire baskets may be bought, and carefully lined with moss, filled with soil, and the geraniums planted. Long trails of flower-covered growth will by-and-by hang down on all sides.

It makes a charming addition to the little garden plot if we can procure a couple of small tubs to stand at the entrance. And no plant looks better in them than the pink-flowered hydrangea. Fortunately these flowers continue for months in good condition. In very many parts of the country they need no winter protection. But if we cannot get tubs even fair-sized pots with some pretty flowering plants in them that we may happen to have could be used like this.

If tubs are used they should be raised above the soil by placing three bricks beneath them. If pots are to stand out in this manner, either they should have a small ring of wood beneath them, or a layer of ashes, the object being to prevent worms from entering through the drainage hole at the bottom.

Just at this season there are thousands of small plants to be bought for a penny or nickel or perhaps ten cents each, so that, if we have not sufficient material to fill our plots, a dollar or so expended now will go a long way to help us.

It may happen that we wish to put out certain plants in rows, either flowering plants or vegetables, and here is the gardener's method of making his line straight and keeping it true. Two stout stakes must be procured and they may be pointed at one end. A piece of "tared line," such as is used for tying up strong plants, is fastened to each.



A good way to get a straight line for plants to be planted in rows—get two sticks and stretch some tared line from one to the other.

At the end of the row the stake is put down into the ground, and the tared line, which has been neatly wound around the unsecured stake, is unwound to the required length. This stake is inserted at the other end, the tared line lying straight along the ground between them and making a guiding line for the required holes the whole distance of the row.

In planting our garden plots we must not altogether overlook the fact that some colors agree better together than others. If there are half a dozen geraniums, and some are red and some are pink, it is better to keep them

separate. White flowers can be placed next to anything, and they show off well at a distance. Rose-colored flowers make a splendid display.

Dahlias must not be planted until all fear of frost is over, and the first week of June will be soon

enough except in the south; this applies to all plants that have been brought forward under glass.

Of course, at this season we may feel cramped for space. There is such a number of things we should like to grow if only the plot would hold them. The best way out of the difficulty is to transplant anything that has finished flowering to some nice cool spot, if we can secure it. For instance, our primrose plants that have been so gay, and their near relatives, the polyanthus, may be carefully lifted with plenty of soil about the roots, and put some-

where else for the summer. They must be watered into their new quarters, and through the coming months they will need watering from time to time. Until they have become settled they should be shaded from the sun. A cool, showery day should be chosen for taking them up, and they should be replanted at once. It is well to remember that, *whatever* we are planting, the roots should not be allowed to become dry. If there are

many plants to be lifted, those first removed should have their roots covered with a piece of damp sacking, or a spadeful of soil should be thrown over them. Never transplant anything in windy weather if it can be avoided; for, after it is in place, until the roots are freely at work again, a plant is terribly susceptible to the drying effects of wind.

Put in your plants firmly, draw up the soil and press it well about them, and in putting in a large plant even tread the soil about it after you have planted it, and never plant when the soil is wet enough to be sticky.



Some pots of pink-flowered hydrangeas make a charming addition to a little garden plot.

MAKING A VILLA FOR MODELTOWN

NOW let us build a Modeltown villa in which we may live ourselves. If we had to build a real villa we should need to look carefully into the cost, or we might find that we had spent more than we could afford, or more than we could pay for; but in building a villa in Modeltown we may have it just as nice as we desire without considering the question of cost, because five cents' worth of cardboard will make a villa with "all the modern conveniences," as the builders say. So we shall make a fairly large villa with a nice porch, a conservatory, a shed for bicycles, and a kennel for the watch-dog.

Picture 1 is a drawing of the villa when it is finished, so we see here what the result of our work ought to be. Picture 4 is the plan of the walls before bending them up. We draw this plan upon our cardboard, making it to double the scale in the picture—that is, using rule B to take the measurements and making our lines with our full-sized rule.

We remember, of course, the meaning of the three different kinds of lines as explained to us on page 482 and elsewhere. At the places where there are crosses in the plan we make pinholes. After cutting out the card, we bend up the walls and glue the side walls to the floor by the projecting slips. To the walls inside we must glue slips of wood, such as large matches without heads, so that the floor will have something to support it.

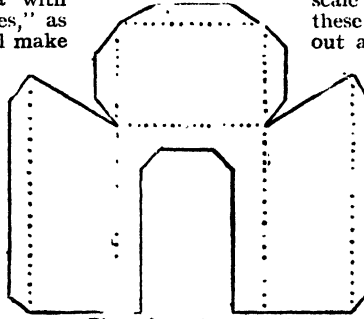
Then we draw and cut out the first floor, the plan of which is given in picture 2, and

the partition for the ground floor, which is given in picture 3. We make these double the scale of the picture—that is to say, we use scale-rule B. When we have fixed the first floor and the ground-floor partitions into their proper positions, the building will look as in picture 5, which shows the front wall hinging open. There are two partitions upstairs, and the plans of these are given half-scale in pictures 6 and 7. We draw these by using scale-rule B, cut them out and then glue them into place

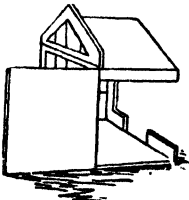
at the dotted lines marked on the plan of the floor. Now let us make the chimney as seen in picture 9, drawing it the same size as in the picture. We know how to attach the chimney to the roof, and the dotted line on the plan of the house in picture 4 shows where the chimney ought to be glued into position. Picture 8 shows the building with all the partitions in place

and with the chimney attached.

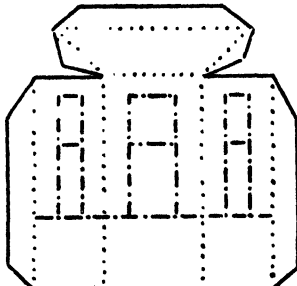
We now come to picture 10, which is the plan of the porch over the front door. This we also make full size and glue on over the front door. The dotted lines around the door in plan 4 and the finished house in picture 1 show where the porch is to be placed. The lower window in the front of the house is to be made into a bay or oriel window, and picture 12, which we make the same size, gives the plan for this. Its position is seen in the view of the finished house in picture 1. We shall find the conservatory a little more difficult than the porch and the



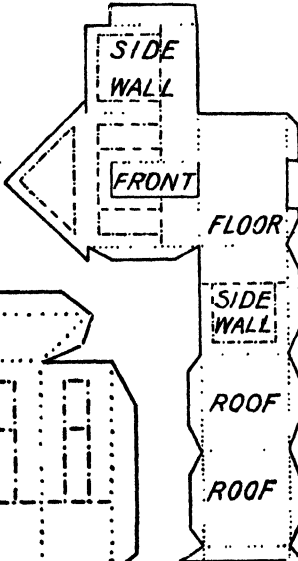
10. Plan of porch : actual size



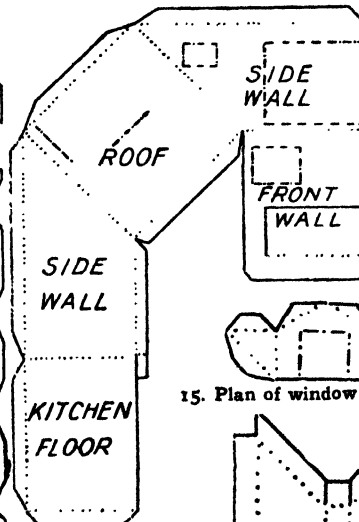
11. Conservatory being made



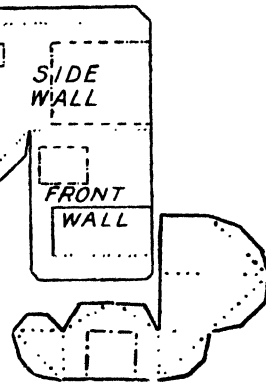
12. Plan of bay window actual size



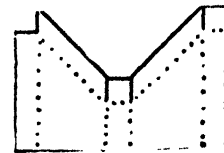
13. Conservatory half-scale Use scale-rule B



14. Plan of kitchen half-scale Use scale-rule B

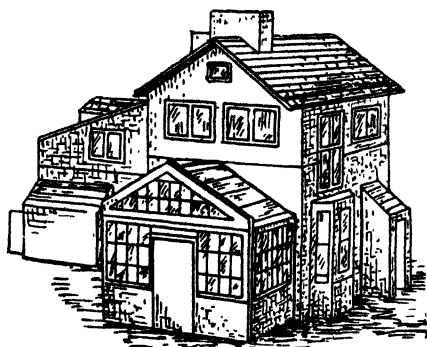


15. Plan of window : actual size

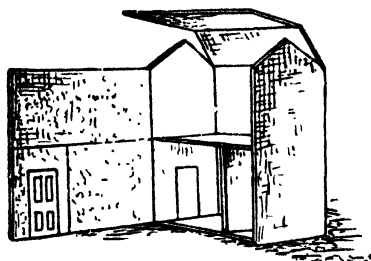


16. Plan of chimney actual size

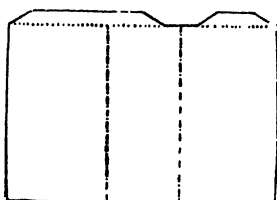
PLANS FOR MAKING MODELTOWN VILLA



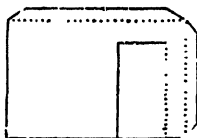
1. The design for Modeltown Villa



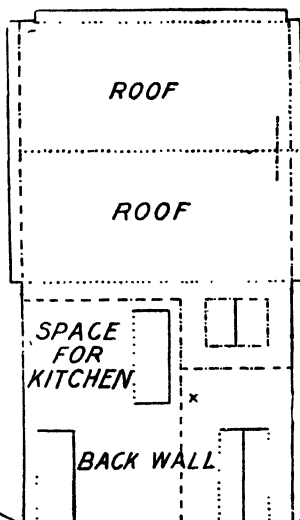
5. Villa with floor and partition fixed



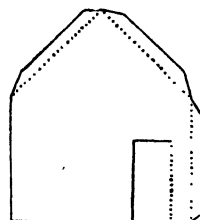
2. Plan of first floor : half-scale
Use rule B to take measurement



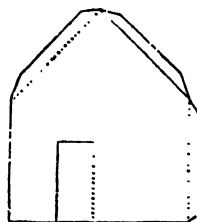
3. Ground-floor partition
Half-scale. Use rule B



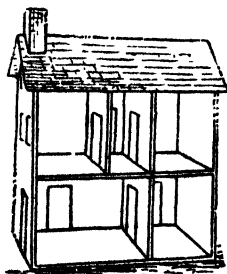
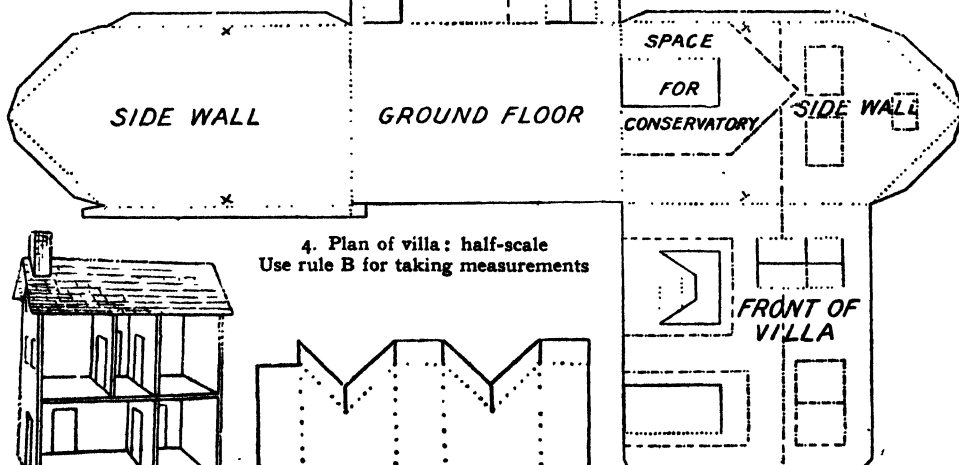
4. Plan of villa : half-scale
Use rule B for taking measurements



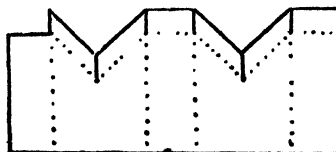
6. First-floor partitions
Half-scale. Use rule B for measurements



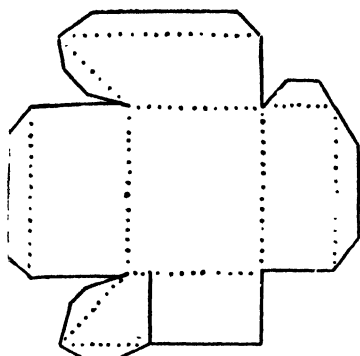
7. First-floor partitions
Half-scale. Use rule B for measurements



8. Villa with all partitions
fixed



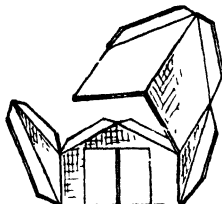
9. Plan of chimney : actual size



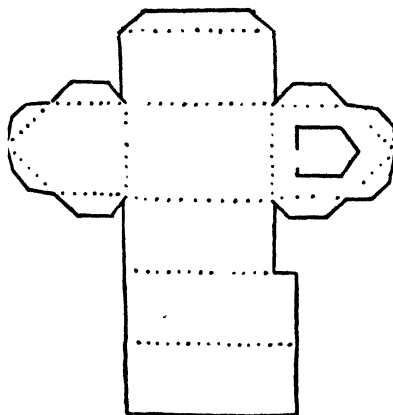
17. Plan of bicycle-house : actual size



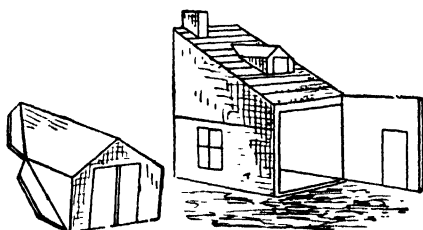
18. Chimney



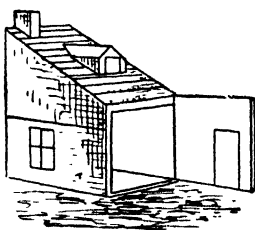
19. Dormer window



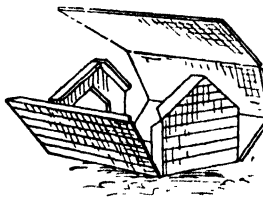
20. Plan of kennel : actual size



21. Dormer window



22. Kitchen complete



23. Folding kennel



24. Finished kennel

bay window. The plan of the conservatory is given half-scale in picture 13. This we make by using scale-rule B for taking the measurements. As we bend it up and glue it into shape it will look like picture 11, and when attached to the side of the house it will be as seen in picture 1.

We have now completed the building of all but the back of the house. We have made no kitchen and we now make this separately.

Picture 14 is the plan of the kitchen half-scale size, which we make by using scale-rule B. The kitchen has a dormer window, the plan of which is given in picture 15, and a chimney, the plan of which is in picture 16. We make both the same size as the illustrations. The chimney when bent and glued will be as seen in picture 18. The dormer window when bent and ready to be glued will be as seen in picture 19, and when glued together ready to be attached to the roof it will be as seen in picture 21. Then the entire kitchen with chimney and dormer window is illustrated in picture 22.

Having done all this, we shall glue the kitchen complete to the back of the house, the position being indicated by lines in picture 4 and by picture 1. Our bicycle-shed is to be attached to the side of the house. Its plan

is given in picture 17, and we make it the same size as the plan, cut it out and glue it to the side of the house as seen in picture 1.

We may want to keep a dog, and after having made such an elaborate villa it is an easy task to make a kennel. The plan of the kennel is given in picture 20, and our drawing on the cardboard must be made the same size. When we are folding it up it will be as seen in picture 23, and when glued together it will be like picture 24.

We have now to paint the walls, windows, and roof. If we put weak glue on the walls but not on the windows, and, before the glue is dry, dust on some dry sand, we shall have a good stuccoed surface. The windows we shall make blue and the roof we shall paint a slate color, which we can get by mixing some red and black if we have no slate. We can make the outside doors and the porch

green, as they are supposed to be wood. We can also make the bicycle-house and the dog-kennel green; but the roof of the bicycle-house we shall make black, because a real bicycle-house would probably have a roof covered with black felt well protected with tar. We have now finished the villa, of which a photograph is shown on this page.



Photograph of Modeltown Villa when finished

WHAT TO DO WITH A GIRL'S WORK-BASKET

4. THE DOLL'S BLOOMERS

THE next garment we are going to make is the little bloomers. These are not quite so easy to do as the chemise or the stays, but, with a little care and attention, we shall soon get over the difficulties.

Picture 1 shows one leg—half of the bloomers. Trace a pattern like this, just as we did for the chemise, according to the size of the doll, and cut two pieces of nainsook to the shape of the pattern, allowing a little over for the seams and hems.

Each piece forms one leg, as shown in the picture. Take one piece, and make a French seam as from A to B in picture 2, which shows the pattern laid on the material for cutting out. This is called the *inside seam*. Then take the other piece for the other leg, being careful to fold the material the other way. If you did not do this, the two pieces would fit one leg only.

Now sew the two legs together, joining them from C to A and from A to D (see picture 2). This is better done by running and felling, if you can manage it, although the French seam answers the same purpose. The legs are now joined, and need finishing at the top and bottom.

The first thing to do is to make a slit in the nainsook about 2 in. long on each side of the bloomers—that is to say, make a slit at the top of each leg on the opposite side to the inside seam. A glance at picture 1 will show you the dotted lines at the side where the slit is to be made. One side of this slit is finished off with a tiny hem. This is the back of the bloomers. The other side of the slit, which is the front part of the garment, is made neat by what is called a false hem, about half an inch wide. A false hem is a hem made of a piece of stuff joined on very neatly to the main part of the work; and the way to fix it is to join the two sides together by little running stitches. Then turn over the material, and make an or-

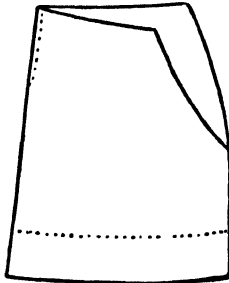
dinary hem. Of course you will see why this is necessary. If we tried to make the opening neat by turning in a hem both sides, we should make our bloomers too small, and so, to prevent this, we join on extra stuff in this way. Picture 3 makes this quite clear.

This side—the wide side—of the bloomers folds over, and buttons over the other side. To prevent the bloomers from splitting right down the leg, the bottom of the false hem should be sewn down on the right side with two rows of stitching, as picture 4 shows.

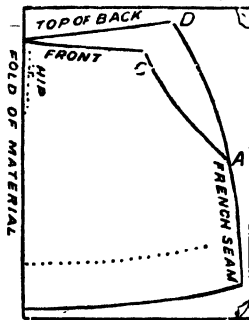
Now, if you hold up the garment you will find it is in two parts, divided by the slits on either side. The wider part is the back and the narrower the front, and each has to be put into a band to make it fit the doll's waist.

The back part of the bloomers, which you will find is much wider than the doll's waist, should be gathered into a little straight band, which must be cut according to the size of the doll. To put this band on, gather the material, and lay the edge of the band against the gathered edge of the bloomers, and run them together. Then take the other end of the band, turn in a tiny fold to make it neat, and hem it down to the gathers on the other side, taking up each little gather on the needle separately. The picture (5) makes this quite clear. But there is one thing we must not forget, and that is to "stroke" down the little gathers before the band is put on.

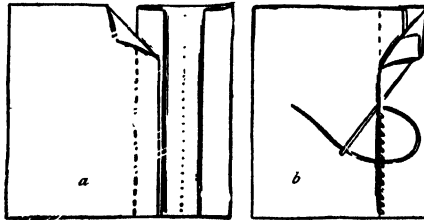
When the gathering is done, pull up the thread as far as it will go. Then take a pin and stroke down each little fold evenly, just as if you wanted to make the material look like a piece of paper that had been folded up in tiny folds like a concertina. Use the *side* of the pin or you will tear the material. The two ends of the band are then folded in, and sewn over with tiny "sewing" stitches. Picture 6 shows how this stitch is done.



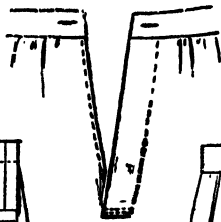
1. Pattern of one leg



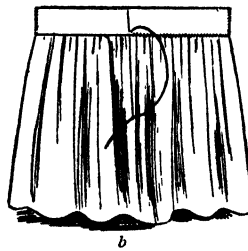
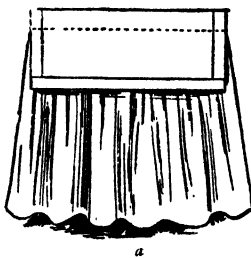
2. Laying the pattern on the material



3. The false hem
a shows the extra piece run on, and b shows it hemmed down



4. The side opening

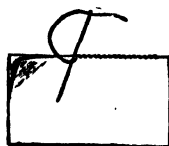


5. The waist-band

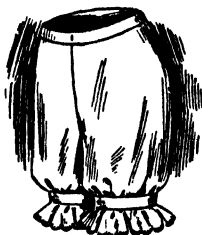
a shows the band run on, and b shows it being hemmed down

Now we have finished the back band. The front one must be treated in just the same way, except that the material will not need to be gathered, but only "eased" according to the size of the doll's waist.

The next thing which we have to do is to finish off the bottom of the legs. If you hold up the little garment again you will see that the ends are very much too wide. This fullness must be gathered with runningstitches, the thread being drawn up till it fits the doll's leg, and then it must be put into a little band. Cut two straight pieces of material for this, which should be about half the width of the other bands we made, one being used for each leg. Make each one long enough to fit the doll's leg, and join the ends by running stitches. Turn in a little piece at the top and at the bottom, and then put the gathers on



6. Sewing stitch



7. The finished garment picture (7).

to it by stitching or feather-stitching top and bottom, finishing it off as neatly as possible.

But we must not forget the buttonholes which fasten the bloomers on to the little stays. These are not at all difficult, for we have already learned to do them on page 730.

There are five of these. In the middle of the front band we must put a buttonhole with barred ends, like the picture (1) which is shown on page 730, and one at each of the four corners of the bands.

All that now remains to be done is to trim the garment. This must, of course, match the trimming on the chemise--either buttonhole scallops or lace. This we learned on page 621. When this is done our little bloomers are complete, and should look as shown in our last

THE BOY CONJURER'S MAGIC SCISSORS

THE trick we are going to describe is more usually known as "The Afghan Bands," but the title of "The Magic Scissors" is better, as it tends to persuade the spectators that the secret lies in the scissors used, though, as a matter of fact, they are quite an ordinary pair.

A little preliminary preparation will be necessary, as follows. Take four strips of stout inch-wide paper, each 6 ft. long. A coil of suitable paper, in length enough for several performances, may be bought at a stationer's for a few cents. Taking one of these strips, we paste the one end over the other so as to make an endless band, taking care, in this case, not to twist the paper. We do the same with a second strip, but give one of the ends a half-turn before joining them. In the case of the third strip we must give it a complete turn, and in that of the fourth a turn and a half. The bands so prepared we will call respectively Nos. 1, 2, 3, and 4. To help us to distinguish them in use, we may, if we please, mark the three last with two, three, and four little dots or pinpricks respectively.

When about to show the trick, we come forward with the four bands hanging in regular order over one arm, and lay them on a table or across the back of a chair. We remark that we are about to exhibit a very curious experiment with these pieces of paper. "Experiment" is a more imposing word than "trick." We take band No. 1, and, with a pair of scissors, snip a small hole midway anywhere in its breadth, after which we proceed to divide it into two portions by cutting onwards from the hole so made throughout the length of the paper. The bands, thus

divided, appear like those marked A in the picture.

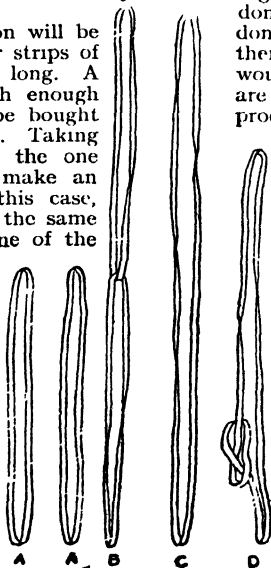
"Nothing very remarkable about that," we remark. "Just what you would expect, isn't it? But now I am going to show you something you would not expect. It's all done by virtue of these scissors. You don't notice anything particular about them? No; I didn't suppose you would. But, as a matter of fact, these are magic scissors, and, naturally, they produce all sorts of magical results. I am going to show you one of them. I take another of these bands" [here we take No. 2], "and cut it just the same as before; but, you see, the result is quite different. We have again two separate bands, but the one is linked within the other." The result is two bands, as before, but one of them is linked within the other, as seen at B.

"Now I will show you a still more surprising result. I take another band" [here we take No. 3], "and cut this one also; but the result is again different." The band is now converted into one of double the original length, and appears as shown at C.

"And now for the most surprising effect of all. This time I shall not only make the paper band increase in length like the last one, but the magic scissors

will tie a magic knot upon it. Please notice that I do nothing to produce the result. It's all done by the magic scissors." The last paper band now appears as shown in D in the figure.

The frequent reference to the scissors diverts attention from the minute difference between the four bands. The reason, by the way, for making them so large is that the necessary twists become less noticeable.



Bands cut with the magic scissors

LITTLE PROBLEMS FOR CLEVER PEOPLE

THE problems are continued from page 736, and the answers below refer to the problems given on that page.

DID HE CATCH THE TRAIN?

45. "The station is twelve miles away," said a cyclist at a hotel, "and I have an hour and a half to catch the train. There are four miles uphill, which I must walk, and can do at four miles an hour; there are four miles downhill, where I can coast at twelve miles an hour; and there are four miles level, which I shall do at eight miles an hour. This is an average of eight miles an hour, and I shall be just in time."

Did he catch the train?

HOW MANY RUGS WERE THERE?

46. "This is awkward," said the carpet manufacturer to his accountant; "there is an entry for a sale, and many of the figures have been obliterated. It reads: 'rugs at £10 os. 2½d. each = £1, . . . os. 2½d.'" "Then we can work it out," said his assistant, and he did.

Can you?

WHAT WERE THE TWO SUMS?

47. "I have two invoices," said the merchant, "which together amount to £34. In one the pounds, shillings, and pence are equal. In the other the pounds are twice the shillings and the shillings are twice the pence."

What were the two sums of money?

THE ANSWERS TO THE PROBLEMS ON PAGE 736

36. It would take 4 hours to walk the 16 miles still to go, but cycling is the quicker way. If James rides 8 miles in 1 hour, and then, leaving the machine, walks right on, he will complete the journey in 3 hours. If John walks for 2 hours he will come to the machine and can ride it the remaining 8 miles in 1 hour, thus arriving at the same time as James.

37. He knew the name of the village from which he had come, and by supposing that the arm of the signpost with that name pointed in the direction from which he had cycled, he was able to tell what roads were indicated by the other arms.

38. The first candle burns for 6 hours and the second for 4 hours. In 2 hours (8.30 to 10.30) the first burns as much as the second burns in 1½ hours (8.30 to 10). Hence, in 6 hours the first burns as much as the second in 4½ hours, so that the second would require one half-hour to burn 1 inch, and it must have been 8 inches long originally, while the first must have been 9 inches long.

39. When his father is three times as old as Harry, the difference between their ages must be twice Harry's age; but the difference between their ages is always 44. Therefore Harry will be 22 when his father is three times as old. Harry, then, will get the bicycle in 10 years' time.

40. Six words. To send a telegram between any two places in this country costs at least 25c. The difference between the price to Albany and to London was \$1.25.

DID HE LOSE MONEY?

48. "I have just sold two houses," said Thomson, "for \$4950 each. On one I lost ten per cent. and on the other I gained ten per cent." "Then you are exactly where you were," replied his friend.

Was he?

HOW FAR DID WILLIAM GO?

49. John met his friend William starting out from his house at 5 o'clock. "How far are you going?" said John. "Perhaps you can guess," replied William. "If I walk at the rate of four miles an hour I shall be there five minutes late, but if I walk at five miles an hour I shall be there ten minutes too soon."

How far was he going?

DID HE CATCH THE TRAIN?

50. A train started from a station 11 minutes late, and went at 10 miles an hour to the next station, which is 1½ miles away, and where it stops 14½ minutes. A man reached the first station 12 minutes late for the proper starting time and walked to the next station at 4 miles an hour to try to catch the train there.

Did he succeed?

HOW LONG DID THE FROG TAKE?

51. A frog fell into a well that was 30 feet deep. He climbed up 3 feet every day and slipped back 2 feet every night.

How long did he take to reach the top?

If we add to this sum the minimum charge for a telegram in this country, 25c., we would have \$1.50, which would pay for a telegram of 6 words to London.

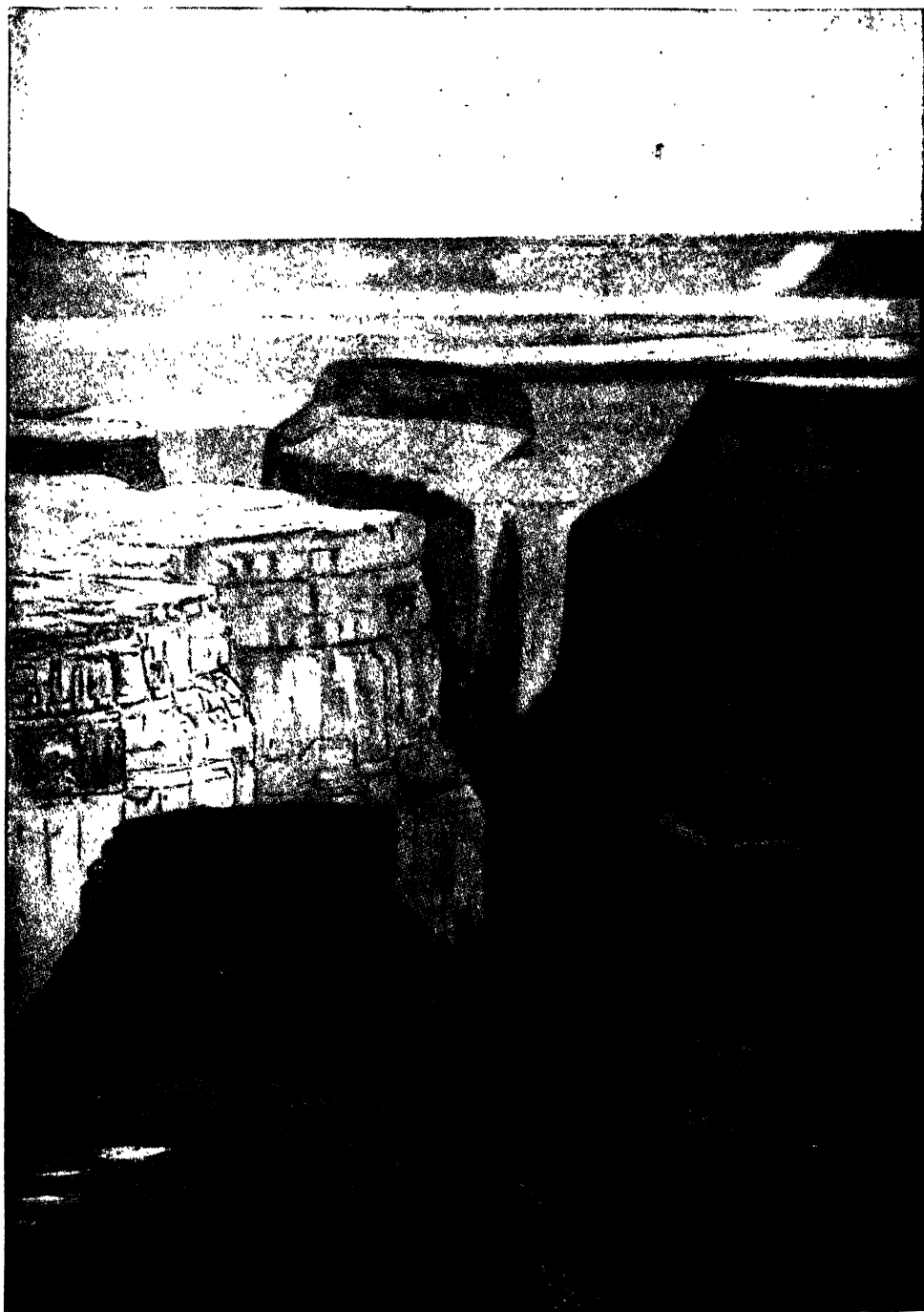
41. The amount split would have served the man who died for 8 days, and this, at 1 quart each day, would have been 8 quarts.

42. I would meet 11 trains coming in the opposite direction, not including the one that would be arriving as I started and the one that would be starting as I arrived. There is 24 hours' difference between the starting times of the trains; but as the trains from opposite sides are going towards each other at the same speed, each train will pass another train every 12 hours. Thus, my train will in 6 days pass 12 trains, including the train that will be leaving as I arrive at my destination.

43. Yes, the second farm was the bigger, and was more than twice as large as the other. Three miles square is 3 miles each way and contains 9 square miles, while the other farm contained only 4 square miles.

44. He was right. Feathers are weighed by avoirdupois weight and gold by troy weight. An ounce troy has 480 grains, but 1 ounce avoirdupois has only 437½ grains. But a pound troy has only 12 ounces or 5,760 grains, while a pound avoirdupois has 16 ounces or 7,000 grains, so that an ounce of gold is heavier than an ounce of feathers, but a pound of gold is lighter than a pound of feathers.

A RAVINE IN THE EARTH A MILE DEEP



One of the most wonderful sights in the world is this great chasm in the earth in Arizona, made, as you see, by a great river carrying away the soft rock, and deepening its bed as it flowed along. This great wonder of the world in the western part of America is in a huge district of desolate plains, called Mesas, from 7,000 to 10,000 feet high, surrounded by high mountains and trenched by immense narrow gorges from 4,000 to 7,000 feet deep. The Grand Canon of the Colorado, as this is called, stretches for two hundred miles, and is in some places fourteen miles wide, and over a mile deep, and down at the bottom of it rushes a mighty river.

The Story of THE EARTH.

WHAT THIS STORY TELLS US

WE must be quite sure what we mean by the earth. It will not do to think, as men used to think in the old times, that the earth is merely the ground we walk on. We mean by the earth the whole of the great earth-ball that spins through space, all the rivers and seas, and the air which floats about it. The air is as real as a stone wall, and it can break a window. When a great gun is fired it sets air waves in motion, and the trembling of the air, if it hits a window, will break it as a stone would do. We read here of the stuff of which the earth is made. Everything is matter; the difference is in the state in which the matter exists. If we melt a sovereign until it runs like water it is still gold, and so it is with all matter. The matter of the earth is in three forms—solid, like stone; liquid, like water; and gas, like air. All matter exists in these three states, just as water may exist in three states—either drinking water, steam, or ice, and still remain water.

WHAT THE EARTH IS MADE OF

WE have said a good deal about one particular kind of stuff which is found in the earth. We can scarcely say it is a kind of stuff of which the earth is made, since it probably does not form more than one part in a million million, even of the earth's crust only; and no one knows whether there is any in the inside of the earth. We had to talk about this wonderful element, radium, however, because its existence even in these tiny quantities tells us so much, and will tell us more, about the past of the earth, and because it is so important for the earth's present and future. But now I want to begin to tell you about the chief kinds of stuff which compose the main substance of the earth—this composition ball, as we called it.

But, first of all, we must get some simple root ideas into our heads, or we shall not know where we are. To begin with, after this, I shall assume that you know what the word *matter* means. Matter is simply *stuff*. The earth is made of it, and so is the sun; our bodies are made of it, and so is the air. Everything is matter, and here we must use the word in this wide sense.

Now, we have learnt already that matter may exist in three states—solid, liquid, or in the form of a gas. When matter is in the form of gas

CONTINUED FROM P. 648



we call it gaseous, and as that is not a very difficult word, I shall use it. Now,

when we speak about the three *states* of matter, we do not mean the different *kinds* of matter. That is quite another question, to which we are coming. Any kind of matter may be in any of these states, and quite possibly, also, in other states about which we know nothing.

We need not talk about these states at present, except just to be quite sure about one thing. This one thing is that matter in the gaseous state, such as air, as we usually know it, is *still matter*—just as real as if it were liquid or solid. It has weight and substance in it, and we can make no greater mistake than to suppose that merely because we cannot see it or feel it, it is not real. If it were not there we should all die at once. We speak of “airy nothings,” as much as to say that the air is really nothing. This is simply nonsense. You may make air so cold that it becomes liquid, like water, or even solid, like ice, but gaseous air is just as real in every possible way as liquid air or solid air, and gaseous water is just as much real, just as much water, and just as much matter, as ordinary liquid water or ice.

We are all apt to be very stupid in this way, however, and until we get

our notions right we shall never make any progress in the study of matter. We shall persist in thinking that what we cannot see or what we cannot feel cannot be real. If you push against the wall with your thumb you feel resistance, and you have no doubt that the wall is real, and that it is made of real matter ; but when you look at the wall and see nothing between you and it, you can scarcely persuade yourself that the space between is filled with matter just as real as the matter of your own body or the matter of the wall.

WHAT HAPPENS WHEN A CANDLE BURNS AWAY

When you move your arm through the air you feel no resistance, and so you think that the air is nothing, or does not count, anyway. Now, I want us all to understand clearly and never to forget that matter may be in three states or conditions—solid, liquid, and gaseous, and that, whether we can see it or not, all these are equally real and equally material ; and I must give you one more example to prove this.

When you burn a candle it disappears. Now, what has happened ? Some people would think that the candle has vanished into nothing, but that is nonsense. *Nothing is made out of nothing and nothing returns to nothing.* The matter of a candle cannot be destroyed ; it can be made *invisible*, so that it is not seen, but that is a very different thing. Certainly it looks as if the matter of the candle was something and now is nothing ; yet we can collect what comes from the candle when it burns, and we can weigh it, though we cannot see it, and we can prove absolutely that not a speck of what was in the candle has been *lost*, but that it has merely been *changed*.

Now, after this, I am sure that you will make no mistake, but that you will regard the ocean of air or gas, for instance, at the bottom of which we live, as real and material—just as much as the ocean of water in which the fishes live.

So, when we start our study of the stuff of which the earth is made, we are to be quite sure that we know what

we mean by the earth. We mean the whole material ball, including the stuff we usually call “earth,” the water, and the air, or atmosphere—that is to say, we are to think of all the matter of which the ball is made, whether it be solid or liquid or gaseous. We are to think of ourselves as living on the outside of the solid earth, or floating (sometimes) on the surface of the liquid part of the earth, but not as being on the outside of the entire earth. On the contrary, there is a great stretch of what is really part of the earth above our heads.

Now, of what is this whole ball made ? It is made of matter in three states—solid, liquid, and gaseous ; and probably a great deal of matter in the very inside of it, which is in some other kind of state that we do not understand and cannot imagine, that is neither solid nor liquid nor gaseous.

Now, the mere *state* the matter is in is not the point. The point is the different *kinds* of matter that we find ; and perhaps we shall discover that many of these kinds of matter are to be found in all the various states ; partly as solid and partly as liquid and partly as gas.

WE CANNOT MAKE GOLD INTO SILVER OR SILVER INTO GOLD

But if the question of solid, liquid, and gas is not what we mean when we talk of the kinds of matter, what *do* we mean ?

Well, the difference between a dime and a gold eagle will show what I mean. Here are two things which are both solid, both made of a heavy and shining kind of stuff, but one is silver and the other gold. You may melt the eagle ; you may even turn it into a gas, and then you may melt it again and make it solid again, but the matter of which it is made will never turn into anything but gold.

You may do exactly the same with the dime ; you may have solid silver, liquid silver, gaseous silver, but it always remains silver ; it will never

turn into gold or anything else. We now know, then, that there are at least two different kinds of matter which help to make up the earth, and



Matter is the same everywhere, but takes many forms. Here are three different things—a diamond, a lead pencil, and a piece of coal, all made of the same stuff.

which cannot be turned one into the other.

Let us take another instance, so that we may not be deceived. Here are three different things, a diamond, a piece of the stuff out of a lead pencil, and some coal-dust.

YOUR LEAD PENCIL IS MADE OF THE SAME STUFF AS A DIAMOND

Now, these are very different to look at, very different in value, very different in the things which you can do with them, and the places where they are found. They are far more different from each other than the dime and the gold eagle were—at any rate, so far as appearances are concerned. Yet if I take this diamond and heat it I can make it turn into black stuff, which is really just the same as coal-dust, and then I can turn that black stuff, or coal-dust itself, into the same kind of stuff as they put into lead pencils, or I can even take coal-dust and turn it into very small diamonds. These three things, then, are not really different kinds of stuff at all. They are actually the same stuff—it is called carbon—in different forms; they are really just as much one and the same thing as ice and liquid water and water-vapour or gaseous water.

Here, then, is a puzzle, and we must be careful. All over the world, in a thousand instances, we can find things which look very different, and yet when we treat them in the right way we find that they are not really different, but are just one and the same thing under different forms. And, as if that were not difficulty enough, we find lots of cases where two things look exactly the same—just as water and liquid air look just the same—and yet, when we come to examine them more closely, we find that they are quite different, and have nothing to do with each other.

THE SIMPLE ELEMENTS THAT CAN NEVER BE CHANGED

This question of finding out the real differences between the various kinds of matter of which the earth is made has engaged the attention of men of science from the beginning, and is now practically settled. On the one hand, we have learnt how to recognize one and the same kind of matter, such as carbon, even though it forms black dust at one time and beautiful large, hard, colorless, transparent crystals at another

time. And, on the other hand, we have learnt to distinguish between what are really quite different kinds of matter, even though, to all appearances, a thing that is made of one looks exactly the same as a thing that is made of the other. You will readily understand what an important question this is, and that, indeed, it was the very first question which had to be answered by the science called chemistry, which is concerned with studying the different kinds of matter.

When we have reduced any piece of stuff to one or more kinds of matter which cannot be reduced to anything simpler, we call those kinds elements, meaning the *simple things*—you know what the word elementary means. We take a certain kind of precious yellow stuff, which is called gold; we can make it hot or make it cold; we can burn it or hammer it or do whatever we please to it, but it always remains gold. It never breaks up into two or more simpler things than gold, and so gold is an element.

THE FOUR THINGS THE GREEKS THOUGHT THE EARTH WAS MADE OF

The same is the case with the carbon that makes diamonds and coal and lead pencil—a very bad name that is for pencils, since there is no lead in lead pencil, but only carbon. And real lead, the stuff that pipes are made of, is another element, and so is copper, and so on. But before we study the principal kinds of elements, we must know what men used to believe were elements. This is not in order that we may laugh at them and show that they were wrong, but because the way in which they gradually learnt they were wrong is very interesting to us.

As long ago as the times of the Greeks—who, though they knew very much less than we do nowadays, were yet far the cleverest and most wonderful people that ever lived, and really began the study of most of the things that we study now—it was supposed that there were just four elements, and if you think of one of the games you play you can guess their names—earth, air, fire, and water. Now, of course, we find these four things composing the earth to-day, and we cannot do better than talk for a little about each of them. Let us begin with earth.

THE NEXT STORY OF THE EARTH IS ON PAGE 955.

THE MEN WHO SAILED THE SEAS



There is something fine in this picture of the boyhood of Sir Walter Raleigh, who afterwards became a great explorer and won many victories over the Spanish. He is sitting with a companion, listening to a sailor, who is telling them of the wonderful lands across the ocean. This picture is painted by Sir J. E. Millais.



One May morning in the year 1497, the age of the early explorers, John and Sebastian Cabot sailed from Bristol on a voyage of discovery. In this picture we see people bidding farewell to the explorers. The ships steered north-west in the hope of reaching China, and in this way Newfoundland was discovered.

The Book of ALL COUNTRIES

FROM HENRY VII. TO QUEEN ELIZABETH

THESE pages tell us the story of three generations of life in Great Britain, when England was ruled by the Tudors—the family name of the ruling house from Henry VII. to Queen Elizabeth. There were still troubles between kings and people, but the times of the Tudors were the beginnings of a great advance. Ever since the Normans went into England a constant stream of soldiers and traders, teachers and scholars had followed from other lands, and the people learned more and more of other countries and peoples. Great sailors and discoverers sailed the seas, and there was a great growth of the trade which has helped so much to make the nation prosperous. Yet there were still tyrant kings, and the nation was to pass through many trials and calamities; and even the developments that took place in the reign of Elizabeth can hardly make one forget the crime and wickedness which come into this part of our story.

THE TIMES OF THE TUDORS

AS one mounts the steps leading to the chapel of Henry VII., in Westminster Abbey, he seems to pass into a new England. The decorations of the chapel, particularly those on the beautiful gates, form a sort of link between the old and the new. The dragon of the last king of the old Britons takes one back to the beginning of English history.

The lilies of France and the lions of England remind us of the long connection and long struggles of the two countries. The crown on a bush recalls the story of Henry's hasty coronation on the battlefield of Bosworth, where Richard died in the thickest of the fight, and his crown was found hanging on a hawthorn-tree. The Tudor roses are everywhere, formed of red and white roses, badges of the two parties in the long civil wars.

When you have admired the roof, the windows, the carved stalls, you will turn to the large tomb within a screen, planned by Henry himself, in which he and his wife both rest. Elizabeth, sister of the little boys murdered in the Tower, was the first to be buried in her husband's splendid new chapel. The figures on the black marble tomb are both portraits.

A fine portrait, too, is that of Henry's mother, Margaret Beaufort,

CONTINUED FROM 776



in the south aisle of the chapel. It was through his mother that Henry claimed his right to the crown, and as you look at her calm, thoughtful old face, her delicate hands raised in prayer, think of her as one who loved and helped the poor, as the friend of Caxton, the printer, as the foundress of colleges at Cambridge. Of her the famous words were said: "Every-one who knew her loved her, and everything that she said or did became her." Two of the badges on Henry's gates belonged to his mother: one is the root of daisies, the other is the portcullis, a sort of sliding door, used in old times to hang over the gate of a castle, and add to its strength and security.

During the lifetimes of Margaret, her son, her grandson, and his three children, the need for strong gateways and portcullises passed away. The old feudal barons, who used to sally forth from castles shut in by moats and gates to put themselves at the head of their knights and servants were nearly all killed off in battle during the Wars of the Roses. The nobles who rose in their stead built themselves open country houses, surrounded by parks and gardens which are still among the chief beauties of England.

The old barons, though some were

bad and violent, had done a great work for their country. It was they who wrung from the kings charter after charter, promising justice, good laws, and just government for the people. It was they, too, who insisted on the kings calling Parliaments to make the laws, and to decide what money should be paid in taxes, and how it should be spent.

THE TUDOR KINGS WHO STOPPED THE GROWTH OF FREEDOM

Now, when the order of strong old nobles was laid low, the new ones owed so much to the Tudor kings that they did not dare to resist them at first, and, as the character of this very clever family was strong and determined, the growth of freedom was stopped for many years.

Henry VII. was very grasping about money; he needed it badly, and made people angry and discontented by the way he forced it from them. He had a hard task to set England straight and to keep it at peace. He saw that nothing could improve if fresh wars were undertaken. So he tried to pacify Scotland and Spain by marrying his children into their royal families. He little thought how far-reaching the results of these marriages would be. His daughter Margaret, named for her grandmother, was married to James IV. of Scotland, and his eldest son, who died young, to a Spanish princess, Catherine of Aragon.

To understand how great a change came about in the world in the times of the Tudors, we must go back to the beginning of the country's story, when the nation was still young. No one then knew anything about the shores of the other side of the sea which lay round about them. Then, as time went on, glimpses of the empire beyond, of which they formed a part, came to the Britons when conquered by the Romans. The Saxons and Danes, from the other side of the North Sea, handed on in their new home the tales of the wild and cold motherland they had left.

THE STREAM OF SOLDIERS, SAILORS, AND SCHOLARS THAT WENT INTO ENGLAND

The influx of the Normans sent a never-ending stream of soldiers and traders, teachers and scholars, constantly crossing and recrossing the Channel. The views gained through them of the continent beyond were ever made larger

and clearer, as the Crusaders pressed on to the East, armies spread all over France, and trade steadily increased. All this time, up to the reign of Henry VII., England was slowly learning more about the earth.

There were some very wise men through the centuries who understood that the world was not really flat. One of them had even found out a way to measure its size and weight. There were also some very adventurous men, who had from time to time sailed away towards the Unknown, and come back with tales of what they had seen. Columbus and his friends showed a new world to the old, as they returned, voyage after voyage, with news of what they had seen at the end of "Nowhere," at the "Back of Beyond."

The excitement of this new wonder, the longing to know more about it, and to share in the riches and glory of the discoveries, spread all over the times of the Tudors in the fifteenth and sixteenth centuries.

THE BLACK CLOUD THAT HANGS OVER THE TIMES OF THE TUDORS

Men's minds were still further awakened in these days by the opportunity that came to them to study, in the beautiful old Greek language, the learning that had been hidden away and neglected for long years. There was a new learning to delight scholars, as well as a new world to astonish the people. There was a new form of religion, too. It began with Wyclif and his translation of the Bible, and men thought about it a long while, trying to decide what was wrong in the old form of religion, and how things could be put right.

Presently, as we shall see, people had to do more than think—they had to act. We, who live in this twentieth century, when everyone is free to worship God as he thinks right, find it hard to understand that only four centuries ago men believed they were pleasing God by putting people to death, if they refused to agree with them. The sadness of the religious struggles in those days hangs like a black cloud over the times of the Tudors.

Catherine of Aragon's bridegroom, Arthur, died before his father, and the Pope was asked to say that it would be right for her to marry her brother-in-

ENGLAND'S GOLDEN AGE OF PAGEANTRY



The warships used in the days of Henry VIII. were very different from those of our own time. The steamship had not been invented, so they were all sailing vessels, and, as the picture shows, they stood high out of the water, with many port-holes for small cannon. Here Henry VIII. is seen embarking at Dover to go to Calais.



In this picture we see Queen Elizabeth, seated on her throne, and surrounded by her Court, receiving the French Ambassador after the terrible murder of the Protestants on St. Bartholomew's Day, 1572. All the Court wore mourning to show the nation's horror of this deed. The picture is by Mr. W. F. Yeames, R.A.



This old picture, now in Hampton Court Palace, represents the Field of the Cloth of Gold, in France. Here, in 1520, Henry VIII. met King Francis I. of France, and the magnificence displayed caused the place to be called the Field of the Cloth of Gold. There were nearly 3,000 tents, many of them covered with cloth of gold.

law, afterwards Henry VIII. He was a tall, stout, fair man, who wore a flat velvet cap, very handsome clothes, with puffed-out sleeves, and shoes with broad toes. He had great quarrels about the number of his wives.

Let us fancy ourselves in the Tudor Room at the National Portrait Gallery, in London, and there study the faces of Henry VIII. and his family, and of those with whom they spent their lives. The figure of Henry VIII. is quite life-like. If you look closely, you will see in his face the self-will and self-pleasing that spoilt the promise of his young bright days, when he came to the throne.

Catherine of Aragon, his faithful wife for twenty years, hangs near, in her Tudor head-dress and square-cut bodice. Overhead, in the bright red of a cardinal's dress, is Wolsey. Henry heaped presents upon him for many years, and they were most intimate friends. Wolsey encouraged Henry to rule without Parliament, and gathered all possible power into his own hands, so that he might make the king supreme.

HENRY GIVES UP HIS WIFE AND HIS GREAT COUNSELOR WOLSEY

When Henry became tired of Catherine, he wanted the Pope to say that she was not really his wife, because she had been his brother's wife first. This the Pope refused to say, and at last Henry made up his mind not to consider the Pope as the head of the Church any longer, but made Parliament declare that he should be the head. But Wolsey was against his marrying Anne Boleyn. Henry, in anger, took Wolsey's high offices from him, and he died in sorrow and disgrace. Shakespeare has written of him in a great play, and has reminded us that some of Wolsey's last words are said to have been these: "Had I but served my God as diligently as I have served the king, He would not have given me over in my grey hairs."

Thomas Cromwell was the next favorite of the king, and for ten years helped Henry to sweep away the old freedom of the country. People were made to pay taxes as the king and Cromwell chose; these two made what laws they pleased, and imprisoned anyone they wished; they even beheaded some of the noblest of the land who dared to oppose them.

HOW SIR THOMAS MORE WENT TO HIS DOOM IN THE TOWER

Look well at the earnest face of Sir Thomas More; he was one of the greatest Englishmen of the day, and for a time a close friend of the king. Henry used to walk with him in his garden by the riverside at Chelsea with his arm round his shoulder. Other friends loved to visit him there, too, and talk of the new learning and of the book More had written, trying to show how best to help the country and teach the people. But there came a time when he could no longer walk familiarly with the king; he felt it impossible to say that he thought it right that he should have married Anne Boleyn. So we sadly watch him go down the steps into his boat, having shut the gate on the children he so dearly loved, and pass along the Thames, so clear and silvery then, on his way to the Tower, where he was beheaded.

Those who traveled much about England during the next three years saw many strange and sad sights. The king's men were met on the high roads, carrying beautiful embroideries hanging from their saddles; the sounds of hammering and smashing were followed by bonfires in the fields, for the order had gone forth that the monasteries were no longer to exist. The monks and nuns were turned out from the buildings, now spoiled of their treasures and ornaments, and in many cases left to go to ruin. These monks and nuns had led useful lives in the past.

THE MONASTERIES THAT SHELTERED THE SCHOLARS IN STORMY TIMES

You will remember how useful they had been in the past; how they had sheltered in stormy times the scholars who wrote and painted the manuscripts from which we can glean so much of the early history of the country. Besides teaching those who wished to learn, they entertained travelers and looked after the poor. But because some of the monks were lazy and bad, this was made an excuse to shut up all their houses and take away the estates and other property that belonged to them. Henry gave some of this wealth to his friends; some was spent in founding new bishoprics; some went to build schools and colleges and ships.

In the midst of all this scene of change

Henry's son, Edward, was born at Hampton Court, the beautiful palace which once belonged to Wolsey. It is open now for all who wish to see it, and is full of memories of the king, who played tennis in the fine court, and sauntered about this lovely riverside and park, over 300 years ago. Edward's mother, Jane Seymour, died soon after he was born. After this Thomas Cromwell displeased Henry, and was sent to prison and beheaded. Great efforts were made in the time of Henry VIII. to subdue the rebellious lords in Ireland and to make the people obey English laws, and even alter their customs and religion to order. This they hated doing, and discontent smoldered on in the beautiful and unhappy sister island.

Edward, sickly and pale, succeeded his father when he was nine, being crowned by Archbishop Cranmer, who arranged the Book of Common Prayer much in the same order as it is to-day.

THE FIRST BLUECOAT BOYS WHO WALKED THE STREETS OF ENGLAND

As Edward was too young to govern by himself, the affairs of the country were managed by his guardians. There was much distress in the country, for the people had not enough work, and they missed the help they had had from the monasteries. Much more of the land was now used for grazing sheep, as the new owners wanted to get rich by selling the wool. When the land was tilled, many more people could find work. Another trouble was that the new landlords enclosed some of the old commons, where the people had had rights ever since the days of the Saxons. They felt this terribly, and in many places there were riots.

The Bluecoat School was founded by Edward VI., and many other schools all over the country. The long coats, bands, and yellow stockings were the ordinary boy's dress in this reign, so in London to-day if one sees a Bluecoat boy in the street he may fancy he is looking at the schoolboys of 300 years ago. In his portraits the young king, with his rich clothes, looks something like a small copy of his father. Edward's health became worse and worse. When the ships of Willoughby and Chancellor were towed down the Thames on their

way to open up trade with Russia at Archangel, the courtiers rushed out of the palace at Greenwich to see them pass and to receive the salutes of the sailors in "sky-colored cloth." Edward heard the cannon from his bed, and when Chancellor returned it was his sister Mary who received him and his sailors as Queen of England.

THE SAD FIGURE OF LADY JANE GREY AND THE COMING OF MARY

Edward had been persuaded to make a will leaving the kingdom to his cousin, Lady Jane Grey, who was a Protestant. The rightful heir, Mary, clung earnestly to the old ways. Poor Jane had no wish to be queen; she was forced into it. You will like her gentle, sweet face. She worked hard with her tutor, whom she dearly loved. He was kinder than her parents, and at sixteen she knew much Latin and Greek.

There are several of her books and letters at the British Museum. One of these is signed "Jane the Queen." Her short reign was passed in the Tower, where she and her young husband were afterwards beheaded. One of her books shown is believed to be the Prayer-book she used on the scaffold.

Mary's girlhood had been sad and lonely for the most part, and after she became queen she had the sorrow of being married to a husband, Philip of Spain, whom she dearly loved, but who cared nothing for her. He spent but little time in the country, but could persuade Mary to do anything he pleased. Together they did all they could to stop the progress of the Reformation and to bring England back again under the power of the Pope.

HOW THE ENGLISH PARLIAMENT KNELT DOWN TO BE PARDONED BY THE POPE

Mary's cousin, Reginald Pole, in the red dress and hat of a cardinal, was sent by the Pope to receive the submission of England. Try to imagine him going up the Thames, in a State barge, a gleaming cross at the prow, to Westminster. There the whole Parliament knelt down to receive from him the Pope's pardon for what had happened in the reigns of Henry VIII. and his son. Mary was happy to think the old faith was restored.

Numbers of men and women, during this and the reign of Elizabeth, were put to death because they dared to keep

to what they believed to be right in religion, and refused to change at the bidding of those in power.

In the midst of all this misery—and who was so wretched as Mary herself?—England lost Calais, called then “the brightest jewel in the English Crown.” It was the last of the British possessions in France, and the loss was a heavy blow to the country and to Mary, who died soon afterwards.

QUEEN ELIZABETH, WHO LOVED FINE CLOTHES AND FINE LEARNING

We come now to Queen Elizabeth. What grand clothes, with tight bodices, huge sleeves, and uncomfortable up-standing ruffs, she wore! What a wealth of blazing jewels, chains, and ornaments! What a hair-dressing! One can well believe the stories of the numbers of dresses she possessed, and the time and thought spent on her toilet.

Elizabeth’s learning and love for books were as remarkable as her love of fine clothes. Among the Royal Books is one of prayers composed in English by Elizabeth’s stepmother, Queen Catherine Parr. This book is translated by Elizabeth into Latin, French, and Italian, all written in her own hand when she was fifteen. Later she replied in Greek to the addresses at the universities, and appreciated to the full the writings of the men who made her reign so great and famous.

HOW SHAKESPEARE STOOD TO WATCH THE MERRYMAKING OF THE QUEEN

There are many beautiful houses still standing, though some are in ruins, where Elizabeth made merry with her Court, for she delighted in going about to pay visits. Can you fancy the rush of countryfolk to see the gay party pass? For the gentlemen wore clothes as smart as the ladies, and the coaches were gilded and painted, and the horses had fine trappings. No wonder these “progresses” helped the people to know and like their gay young queen. It is said that Shakespeare came from his home near by, and, standing among the crowd, saw the acting and shows that went on for days.

On the left side of Elizabeth’s portrait in the National Portrait Gallery, the thoughtful grey eyes of Burleigh look steadily at us. The queen had to face many great difficulties all through her

long reign, and Burleigh was one of the faithful and good advisers who helped her to put an end to the quarrels about religion, and to keep at peace with other countries as far as possible.

A portrait of another of her friends hangs near the queen’s, that of Sir Walter Raleigh, of whom the story is told that, when walking with the queen, he put down his beautiful cloak over a muddy place, so that she could pass over without harm.

All through her reign Elizabeth had troubles connected with Scotland. Henry VII. had married his daughter, Margaret, to James IV. of that country. When James was killed at Flodden, his queen ruled for her little son, James V., till he was grown up. There is a most interesting letter from Catherine of Aragon to her husband, Henry VIII., then away in France, telling him of the victory at Flodden, and sending him part of James’ coat for a banner. James V. died early, too, and sadly left his kingdom to his “little lass,” Mary Stuart, whom England knew so well as Mary Queen of Scots.

THE QUEEN’S COUSIN, WHO LEFT A THRONE TO DIE IN A TOWER

Scotland in those days was torn in two, like England, between those who followed the Pope and those who did not. Those in favor of him sent little Mary to France to be brought up there, and to marry the French king’s eldest son. There is a portrait of Mary in white widow’s mourning. Her young husband soon died, and Mary sorrowfully left the gay Court of France and went back to very hard and troubled times in her own kingdom. She was one of the most beautiful women of her time, and had such charming manners that most people were eager to please her. She married her cousin, Darnley, and their little son became James VI. of Scotland.

There is still to be seen a letter from Mary, in French, to Elizabeth, asking for more liberty, and for leave to write to her son, who, she says, was torn from her arms. What had Elizabeth to do with it? And why was the boy away from his mother? It is a long, sad story, and gets sadder and sadder to the end.

Mary had many quarrels with her subjects, the chief one being that they

A QUEEN'S FAREWELL TO FRANCE



In 1561 Mary Queen of Scots, who on the death of her husband was no longer Queen of France, was invited to return to Scotland. She embarked at Calais. Spreading her couch in the open air, she asked to be waked in the morning if it were fine, that she might take her last farewell of the land she left. The morning was clear, and here we see the queen gazing back towards the country she loved, murmuring sadly, "Farewell, France! Farewell, France! I shall never see thee more." At home troubles arose, and, in consequence of plots to make her Queen of England, Mary was put to death by order of Queen Elizabeth, her cousin.

believed she had something to do with the murder of her husband, Darnley. Presently she fled to England, and Elizabeth kept her a prisoner in various castles for the rest of her life.

During these long years plots were always going on to make Mary queen instead of her cousin, Elizabeth. At last, when it seemed to be certain that Mary was joining with those who tried to kill Elizabeth, Elizabeth condemned her cousin to be beheaded. This was a great grief to those who loved her.

THE GREAT WEALTH AND THE GREAT CRUELTY OF SPAIN

A year after Mary's execution, England passed through a great and most exciting time. Soon after Elizabeth became queen, Philip, her brother-in-law, had wanted her to marry him, so that England and Spain might join against France. Spain was very powerful then, because it possessed the Netherlands, so rich from commerce in the wool trade, in which England had a share. Spain had, too, the wealth brought by the splendid discoveries of Columbus in the New World. But Elizabeth would not listen; she helped Philip's Protestant subjects in the Netherlands, and Philip in return helped Mary's plots against Elizabeth. The English hated the Spaniards at this time for their cruelty to the Protestants, and also because they tried to keep England out of all the trade they could in the New World. Sailors, such as Hawkes and Drake, pounced on the Spanish treasures when they could, either on shore or at sea, and at last Philip determined to add England to his other dominions by conquest.

HOW SIR FRANCIS DRAKE FINISHED HIS GAME AND BEAT THE SPANIARDS

The story goes that Drake and his captains were playing bowls on Plymouth Hoe when news came that a huge fleet was slowly coming up the Channel, to help to land a great army of Philip's from the Netherlands.

"There is time to finish the game," said Drake, "and beat the Spaniards, too."

Philip had counted on help in England, but he was mistaken, and all flew to arms for queen and country. Ships poured out of every harbor as the

Armada sailed in a broad crescent up the Channel. Elizabeth, on horseback, reviewed her troops at Tilbury, encouraging her captains and men by her presence and her speech.

"I know," said she, "that I have but the body of a weak and feeble woman, but I have the heart of a king, and of a king of England, too."

The motto on the medal struck in honor of the great victory and deliverance that followed tells the story of what happened in a few words: "God blew with His wind, and they were scattered." The great ships of the enemy were slow and helpless and got in each other's way; while the little "sea hawks" of the English darted in and out, and drove the Armada out to sea by sending fire-ships among them, so that they fled away to the North Sea in a terrible storm. Those that were not wrecked escaped round the north of Scotland and west of Ireland. To this day there are traces here and there along the coasts of the disastrous retreat of the Spanish Armada.

THE END OF ELIZABETH'S REIGN AND THE END OF THE TUDORS

Try to imagine the relief and joy of the country, the ringing of bells, the bonfires, the thanksgivings! For thirty years the terror of Spain had hung over it, and now that power was laid low, and England became of real importance among the countries of Europe.

Poor Elizabeth! Notwithstanding all the greatness and glory of her reign, the excitement of discoveries, the satisfaction of success, when the end came it found her a lonely, sad old woman. Most of her friends died before her. She had neither husband nor child to care for. She had never seen Mary's son, who was to succeed her, but she wrote to him two months before her death, begging him not to believe some charges brought against her. She signed herself, "Your loving and friendly sister, Elizabeth."

This was in January. Late in March a rider sped north on relays of horses, night and day, to be the first to tell James Stuart, the King of Scotland, that he was also King of England. The times of the Tudors were ended; the Stuarts had come.

THE NEXT STORY OF ENGLAND IS ON PAGE 1035.

A GAME OF BOWLS AND WHAT FOLLOWED IT

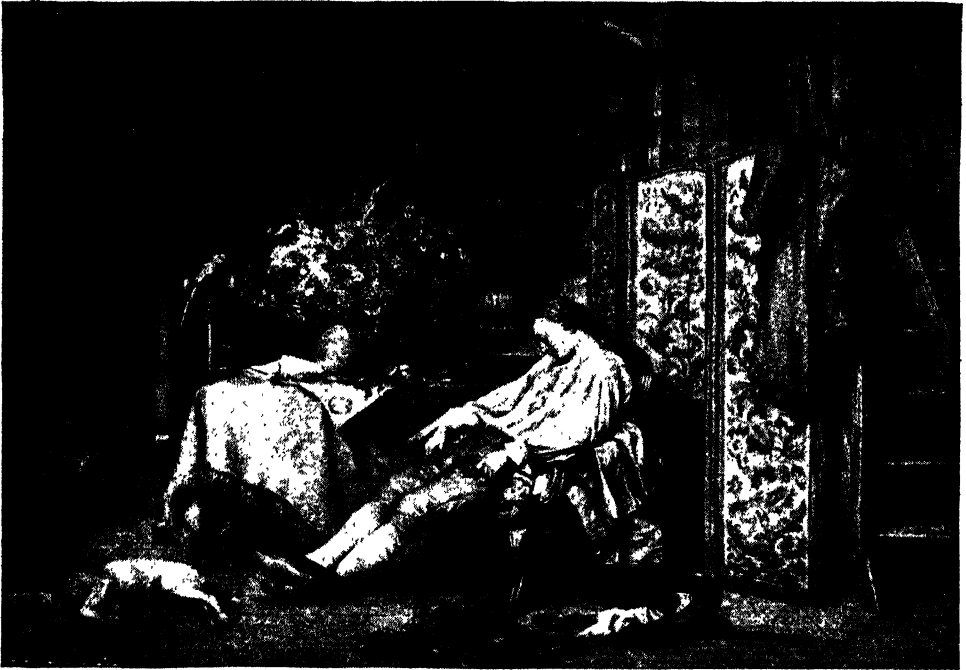


Sir Francis Drake was one of the great sailors of Queen Elizabeth's time. When the Spanish Armada, the great fleet Spain sent against England, was sighted, Drake and his officers are said to have been playing bowls at Plymouth. "There is plenty of time to finish the game and beat the Spaniards too," said Drake. This picture, painted by Mr. Seymour Lucas, R.A., is printed by courtesy of Messrs. Henry Graves & Co.



The Spanish Armada was destroyed in a storm. The King of Spain's fleet was utterly broken up and chased through the English Channel by the English Fleet. The ships tried to escape round the coast of Scotland, but great storms overtook them and the vessels were dashed to pieces on the rocks. In this picture, by Mr. Albert Goodwin, we see all that was left of one of the largest of the ships of the wrecked Armada.

CHARLES LINNÆUS AND CHARLES DARWIN

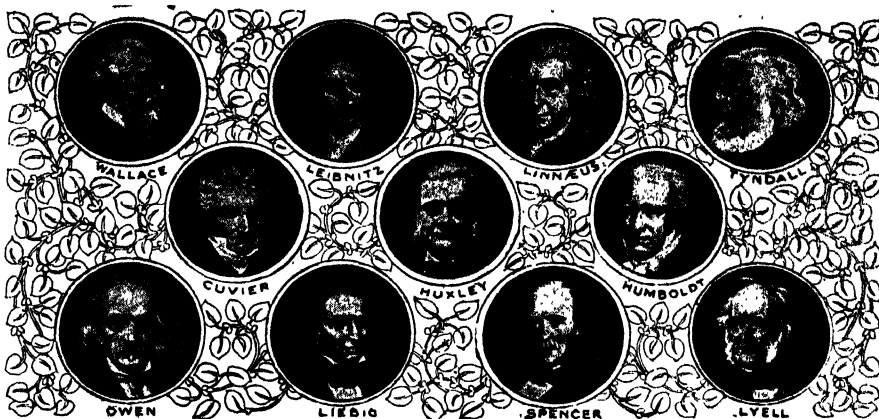


Linnæus, the great Swedish scientist, was the father of modern botany, for it was he who first arranged the world's plants in a scientific manner. It was in spite of the greatest difficulties that he followed his favorite study in his youth. In this picture we see Linnæus as a young man, just returned from a long botanical ramble. He and his dog are exhausted, and on the table we can see the results of the walk



One of the most popular of Charles Darwin's books is his "Naturalist's Voyage Round the World," in which he tells of his experiences and discoveries when he traveled as official scientist with the warship Beagle. He thoroughly studied the geology of South America. Here we see him discovering a fossil mastodon that was exposed on a cliff near Santa Fe. It was in too crumbling a state to be removed.

The Book of MEN & WOMEN



FAMOUS MEN OF SCIENCE

DARWIN
HUXLEY

SPENCER
TYNDALL

OWEN
LYELL

CUVIER
LIEBIG

BUCKLAND
HUMBOLDT

LINNAEUS
LEIBNITZ

SOME of the greatest men of all ages have been those who have extended our knowledge of science without inventing anything which can be touched or handled. Yet the value and importance of their discoveries have been more than we can reckon. We shall here glance at the careers of a few such men, remembering that they are merely examples, and not the only men who could have been chosen.

First we shall take Gottfried Wilhelm Leibnitz, a German philosopher, who was born at Leipzig, in July, 1646. As a boy he set himself to study subjects which the ordinary scholar would think too dry. His father died in 1652, and little Gottfried was allowed by his mother to read at will in the family library. The result was, that when, at the age of fifteen, he went to the university, he was soon able to publish two valuable treatises on the philosophy of law. He studied chemistry, philosophy, law, politics, and religion, and soon knew all the great men in Germany.

At this time Louis XIV. of France was thinking of invading some of the German states; but Leibnitz wrote a work suggesting the invasion of

CONTINUED FROM 766



DARWIN

Egypt by France. It was not very friendly to Egypt, but it saved Germany; for the king became interested in the scheme, and refrained from attacking his country. We shall hear of the plan of Leibnitz later in our story.

Leibnitz traveled to London, where he met the great scientists, who had just formed the famous Royal Society. Newton was, of course, of the company, and the friends of Leibnitz and the friends of Newton were destined to quarrel over a great mathematical discovery which both men had made independently. Leibnitz framed a great scheme of philosophy; he gave us laws enabling us to understand the meaning and force of energy; he collected a great deal of material showing the history and relation of the various languages of the world; he helped to establish scientific institutions, like the Royal Society, in various European capitals, and he labored to better the health of mankind.

Leibnitz died at Hanover in 1716, but nine years earlier a little boy had come into the world, of whom men were to hear much. This was Carl, or Charles, Linnaeus, who was born the son of a poor clergyman, at

JULIUS CAESAR

HERBERT SPENCER

Rashult, Sweden, in May, 1707. The father had a garden, which he stocked with common and uncommon plants, and here little Carl loved to study Nature. Flowers which had no meaning for others seemed to be an open book of knowledge for him, and many were the experiments he would try, by bringing in new wild flowers from the woods and planting them in his father's borders.

CHARLES LINNÆUS, THE POOR BOY WHO BECAME FAMOUS ALL OVER THE WORLD

In 1727 he was sent to Lund, and afterwards to Upsala University to study medicine, but he devoted himself mostly to the study of botany.

His love of Nature was discovered by a kind professor, through whose help Linnæus was sent on a scientific tour in Lapland. The book which he wrote, giving the result of his travels and investigations, brought him the friendship of a rich Dutch banker, who employed Linnæus to superintend his lovely garden. The naturalist delighted in this work. He classified all the plants and trees and shrubs, and, while so studying, wrote his first great work on the scheme of things in Nature as it seemed to him.

Afterwards he held various professorships; he lectured and practised as a doctor; he was honored by his sovereign, and was able to buy himself a charming little estate, where he gathered together a wonderful collection of plant and animal life. This collection was afterwards bought for England. His days closed in peace and happiness in 1778; and he was beloved and greatly respected by the whole of Europe.

THE BOOK BY LINNÆUS THAT HELPED ANOTHER BOY TO WIN FAME

Linnæus was the founder of modern botany. He classified all plants and trees in scientific order. He did the same thing for the animal world. He thus laid the foundation of classification for the whole realm of Nature. His work has, of course, been greatly extended and developed; but it is his system which we have followed, and his scientific names which we employ; names which describe in Latin or Greek the nature and characteristics of the animal or plant to which a title has to be given. He it was who brought order out of chaos in Nature's great family.

One of the first fruits of the labor of Linnæus was to win for natural history the services of the great Leopold Christian Frédéric Dagobert Cuvier, whose literary title was "Georges Cuvier." He was born at Montbéliard, at that time belonging to Würtemberg, in August, 1769, of French parents. Cuvier proved a diligent student, and assembled all the cleverest boys in his school, and formed what they called an academy of learning.

So deserving a boy was Cuvier that the Duke of Würtemberg sent him to the Stuttgart University, where, to his intense joy, he was given a copy of one of the master works of Linnæus. From that time he devoted himself to the study of natural history. He had to serve for a short time, on growing up, in a Swiss regiment, but when he was eighteen years of age he entered the service of a family in Normandy as private tutor. Here he remained for six years, sheltered from the horrors of the Reign of Terror; and here great events followed a very simple thing.

HOW CUVIER LEARNED TO READ THE WONDERFUL BOOK OF THE EARTH

Some fossils were dug up near his home, and diligent study of these revealed to Cuvier wonders of the past of which no one else had dreamed.

Up to that time fossils, which had clearly at one time been animals, were regarded as freaks of Nature. It never occurred to men that these fossils had any relation to living things, or that their descendants were alive on the earth before their eyes. But Cuvier had got a clue, and he now entered upon a work from which he never turned back. He filled important public offices in France, and did much for the nation when given control of her educational system; but he is of most importance to us as the father of palæontology.

The word palæontology is made up of three Greek words—*palaios*, meaning ancient; *onta*, meaning beings; *logos*, meaning discourse. Hence the word means the science which treats of living things that inhabited the earth in ancient days. All the wonders of the past—of which we read on page 51 and succeeding pages—are revealed to us by the palæontologists, of whom Cuvier was the first. He was also a great comparative anatomist. By comparing the

anatomy of various animals, he was able to discover those features in which they resembled each other, and those in which they differed, and so to classify such animals scientifically.

Here is a little story showing how well his classification helped him to a decision respecting the characteristics of animals.

One of his students determined to give him a fright; so, dressing himself up as an animal, he crept one night into the professor's bedroom.

"Cuvier," he cried, in a hollow voice—"Cuvier, I've come to eat you!"

The naturalist peered at him and laughed.

"What, horns and hoofs—graminivorous—you can't!" he said.

He saw that the supposed monster had horns and hoofs, and he knew that all such animals eat grain or herbage, not flesh.

Cuvier was one of the greatest naturalists that ever lived, but for all his knowledge and for all his intellect, he followed Linnæus in making a serious error. Both believed that a species cannot change. Let us leave this problem for a moment; we shall return to it later when we meet Charles Darwin.

HUMBOLDT, THE GERMAN BOY WHO LISTENED TO TALES OF CAPTAIN COOK

Another great naturalist was born in the same year as Cuvier. This was Friedrich Heinrich Alexander von Humboldt, who was born at Berlin in 1769. While Cuvier dug down into the earth for secrets of the past, Humboldt went exploring to explain the mysteries of present-day life. He was studying at a university which then existed at Frankfort-on-the-Oder, when he met George Forster, who had accompanied Captain Cook on his voyages, and, hearing Forster's tales, Humboldt was fired with a desire to travel.

But he had to wait until he was thirty before he could start. The great French wars of the period made it impossible for anyone to send out ships merely for exploration and study. In 1789, Napoleon, acting on the plan submitted by Leibnitz to Louis XIV., did decide on invading Egypt; and Humboldt should have gone, but at the last moment there was no room for him in the ship.

In the end it was under the flag of Spain that he sailed. Spain owned

nearly the whole of South America, except Brazil, at the time that he went forth to explore. He made a wonderful journey, lasting nearly five years. He explored Venezuela, Colombia, Ecuador, Peru, Cuba, and Mexico. He learned the manners and customs of their peoples, saw the relics of the marvelous old civilization dating back to times before the arrival of Columbus in America. He learned all about their wonderful birds and animals and fishes.

THE WONDERS OF LIFE IN AMERICA OF WHICH HUMBOLDT TOLD THE WORLD

Among other things, he saw the electric eels in their native rivers, and collected specimens of birds, fishes, and animals previously unknown to Europe. He made scientific observations which led to the establishment of magnetic surveys by all the nations. He braved many perils in exploring the mighty waters of the rivers Orinoco and Amazon and their tributary rivers; and during his travels his right arm was poisoned, partly crippling it for the rest of his life.

When he returned to Europe, taking with him his collection, he had years of work before him in order to give to the world the result of his investigations, in geography, in the manners and customs of the peoples, and, above all, in natural history. His books ran to thirty great volumes, with hundreds upon hundreds of illustrations. When he was sixty years of age, Humboldt undertook another exploration, this time in Northern and Central Asia. Here, again, his travels, though rapid, were of importance in giving us knowledge of the subjects in which he was interested.

THE BUSY GREAT MAN FOR WHOM A SERVANT WOULD NOT TELL A LIE

The greater part of the last thirty years of his life was spent in Berlin, where he died in 1859; but he loved Paris, and would steal away to work there in peace and quiet. He was always accompanied by a faithful, honest old Swiss servant, who would not tell a lie. So when the people used to call at the little house in Paris where Humboldt was secretly working, the servant would say, in answer to inquiries: "Yes, my master is in, but he wants me to say that he isn't."

That great geologist, Sir Charles Lyell, went, like Cuvier, to the rocks for his facts, but his purpose was to tell the

story of the earth itself. He was born in Forfarshire in 1797, and at Oxford University became a good classical scholar. His parents wished him to follow the law; but though he did become a barrister, his heart was not in lawyers' laws, but in Nature's laws. At Oxford he had heard the lectures in geology of William Buckland, the famous scientist who, in his later years, became Dean of Westminster.

HOW LYELL BUILT UP THE STORY OF THE EARTH OUT OF THE ROCKS

Buckland afterwards took Lyell for a trip to Scotland to study geology, and after that the young man's heart was wholly given to science. Through Buckland he met Cuvier and Humboldt, and their friendship and counsel further inspired him. He gave up the law, and took entirely to the study of geology. He traveled all over England and Scotland, and in Europe and America. The outcome of his work was a great book on geology, which for the first time made clear the true story of the earth as we know it to-day.

Previous opinion had been that the form of the earth's surface, her great mountains, her deep valleys, her vast ocean-beds, had been caused by terrible disasters, that the world had been wrenched and twisted and distorted by earthquakes and volcanic eruptions. But Lyell showed that the causes which had made our world what it is are still in operation before our eyes to-day. He showed that, though a volcano may be created in a night, mountains *grow*; that the shrinkage of the earth, and the terrific pressure which it causes, make mountains rise out of flat rocks; that great folds in the solid rock are caused in the same manner; that frost and rain and wind wear down mountains, and cast their debris into the sea, to build up there, at the bottom of the water, land which will some day rise above the sea to form new continents when the existing ones disappear.

LIEBIG, THE SHOPKEEPER'S SON WHO BECAME THE WORLD'S GREATEST CHEMIST

Buckland made Lyell a geologist. He was also the means of bringing to the help of British agriculture one of the greatest chemists of all time, in the person of Baron Liebig. Liebig was not born a baron, but was the son of a poor drysalter of Darmstadt, Germany,

in which town Liebig was born in May, 1803. He loved to try the experiments of which he read in old books, and, after many struggles for education, was befriended by the good-hearted Humboldt. Humboldt introduced Liebig to a rich friend who finished his education, and Liebig was enabled in time to become the greatest chemist and the greatest teacher of chemistry in Europe. He gave new life to chemistry, and trained men from all parts of the world. The thing that he did for England was in relation to agriculture.

In spite of the ordinary farmyard manure, the land was getting poorer and poorer, because the crops took so much out of the soil that could not be replaced. Liebig insisted on the use of artificial fertilizers, chemical substances containing the properties which the land requires.

Now, one day Buckland had noticed ladies wearing, as part of their jewelry, stones which, by their markings, he recognized as fossils. These ornaments were neither more nor less than food which, eaten millions of years ago by animals, had been converted in the earth into fossils. He discovered great stores of these coprolites, as he called them, buried deep in the earth.

THE BEGINNING OF A GREAT INDUSTRY, AND THE BIRTH OF A GREAT MAN

Liebig went to visit Lord Playfair, a great scientist and noble-hearted man, who, among other things, had translated Liebig's writings into English.

When Liebig was visiting Playfair, Buckland showed him his store of fossils. Playfair took away some of the fossils, had them ground up in his laboratory, and found that they abounded in phosphate of lime, the very thing the soil needed. This at once gave Liebig the idea of utilizing ground bones for fertilizing the soil, and then and there began the great artificial fertilizer industry in England upon which its agriculture so much depends.

While Liebig was at work enriching the soil, there was another great man, Sir Richard Owen, delving in it for more of its secrets. Owen was born at Lancaster, in 1804, and lived to be eighty-eight, and from early manhood to the last years of his life he was pouring out a flood of knowledge for

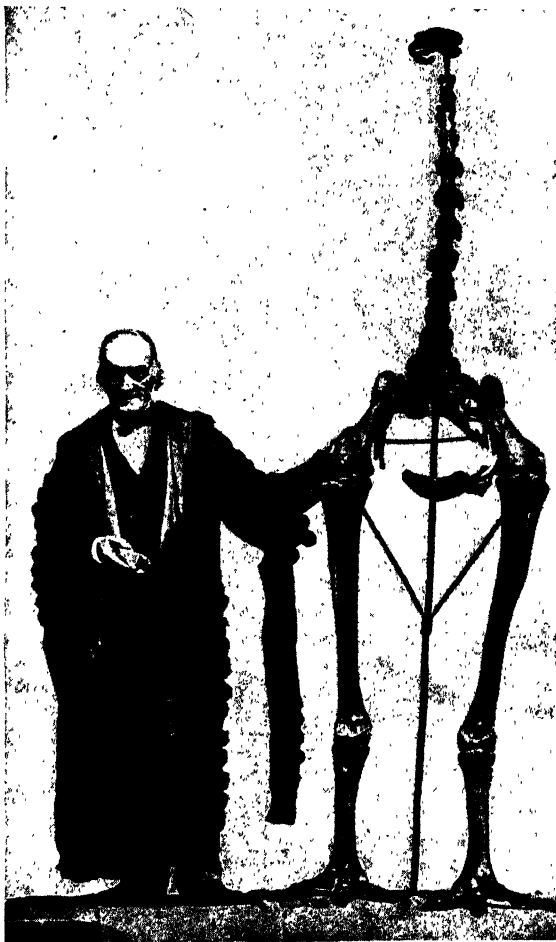
us upon life in the ancient world, upon the work of the human body as it is to-day, upon geological problems, and upon a thousand matters relating to natural history.

And yet this great scientist had no other ambition in early life than to go to sea, perhaps as a ship's doctor! While waiting for an opening in the Navy, he entered the service of the Royal College of Surgeons, and was placed in charge of the magnificent natural history collection got together by John Hunter, whose story we read in this work. Owen devoted years and years to classifying and explaining this collection in printed books. He met Cuvier, and carried on in England the work which the Frenchman had begun abroad. Owen rivaled Cuvier in piecing together the life history of an animal or bird of which he had but a single bone. The most famous achievement was with the extinct *Dinornis*, the giant bird of New Zealand. Someone sent over a leg bone of one of these birds, a fossil bone thirty-four inches in length. From that single bone Owen was able to picture and describe the whole bird.

Later, more bones of such a bird were discovered in a river-bed in New Zealand, and, when put together, they were found precisely to correspond with the description which Owen had given.

Owen did much for the spread of scientific teaching. King Edward VII. and the Duke of Connaught passed many happy hours listening to his lectures at Buckingham Palace. One day, the Duke of Connaught, who was then quite a little boy, was so delighted that, at the end of the lecture, he secretly followed Sir Richard out into the corridor and, as a reward for the pleasure he had had, played him a tune on a

new musical-box which had just been given to him. No wonder that the great scientist thought the royal children were delightful little people. We have seen that Owen was a disciple of Cuvier and of Linnaeus, and that these two did not believe that species could vary. Therefore we may know that Owen did not see eye to eye with Charles Robert Darwin, the man who caused the greatest sensation in the world of thought since Newton discovered the law of gravitation. Men had thought, as we have seen, that species could not alter. They thought that for every species there had been



SIR RICHARD OWEN AND THE SKELETON OF A BIRD
Professor Owen built up this skeleton of a *Dinornis*, an extinct bird, that no living man had seen, from a single bone sent him.

a separate creation. They thought that the remotest ancestors of cats had always been cats; that dogs had always been dogs, that wolves and jackals and hyenas, lions, tigers and leopards had, in the past, always been exactly as they are to-day. They thought that all living things had descended from ancestors exactly like

themselves, that there had been no change in animals or plants from the dawn of creation. Darwin is dead and gone, but his work will live for ever, and we may easily see the plan of his teaching from three simple things that he left among the specimens which he collected during his life-long studies.

THREE THINGS LEFT BY DARWIN WHICH EXPLAIN THE PLAN OF HIS TEACHING

First we notice a common Indian jungle fowl. That bird is descended from fowls like itself, but from that family of fowls have come all the varieties of domestic fowls. Next we have a common blue rock pigeon, which represents the parent stock from which are descended all our pigeons—homers, pouters, fan-tails, turbits, Jacobins, and the rest. The third is a common wild Chinese chrysanthemum. Wild chrysanthemums like this are the parents of all the chrysanthemums in the world. And what has happened in regard to poultry, pigeons, and chrysanthemums is believed to have happened also in the case of thousands of other species in animal life and plant life. Some specimens differ so much that it is hard to believe they are related.

Who was the man who taught this strange doctrine, and gave such a mass of knowledge to the world? Darwin is that man, and we read a charming story about him in this work. He was born at Shrewsbury, in February, 1809, and was the son of a doctor, who intended him for the Church. But he was a born naturalist, and when there came the chance of going for a five years' scientific cruise round the world in the ship *Beagle*, he earnestly begged his father's permission to go.

WHAT THE WORLD OWES TO THE SHAPE OF A BOY'S NOSE

His father thought that it would ruin his character to go; it was a mad scheme, he declared. Still, he said, if the young man could find one reasonable man to support him in his desire, then he would give his consent. Darwin found that one man, his uncle, a man in whose judgment the elder Darwin had great faith. The uncle was of opinion that the youth should go, for he had been impressed by the fact of his having a nose of peculiar shape. And, as Darwin used afterwards to say, his whole career depended upon the shape

of his nose; and we may add that the world owes to that little peculiarity the vast sum of knowledge which Darwin by this voyage was able to contribute. Upon such trifles do great events turn.

The tour round the world gave the careful and observant Darwin a rare opportunity for observation of all kinds of animal life under all sorts of conditions. We must all read for ourselves his delightful volume on the great voyage. When he came home he married happily, and settled down in a pretty old house at Downe, in Kent. There, year after year, he toiled away, arranging and describing the specimens which he had brought home; there he watched his poultry and pigeons and dogs, his fruit and bees and flowers, and all the time his great mind was slowly working its way toward the light with regard to the wonderful theory which we have been considering.

HOW CHARLES DARWIN & ALFRED RUSSEL WALLACE THOUGHT THE SAME THING

He was a slow worker, for his health was bad, and he was nervous about making a statement which might be challenged. Little by little he was building up his theory, and at various times he had shown some of his written conclusions to Lyell and others. What would have happened otherwise we do not know, but before his greatest book was published a very romantic thing occurred.

Dr. Alfred Russel Wallace, who was at the time exploring and studying in the Malay Archipelago, sent him a paper which he had written, showing that, all unknown to each other, the two men had been working in the same direction. They had both arrived, by separate paths, at the same conclusion. The most startling theory in the modern history of knowledge had come to two men at about the same time. Friends of Darwin to whom he showed Dr. Wallace's paper told him that he must at the same time produce with it his own studies which had been so long in preparation. The two papers were read at the same meeting of the Linnæan Society, and in 1859 Darwin published his masterly work, "*The Origin of Species*." It created a furious storm of criticism, which raged

through England, the Continent, and America. Darwin's views gained many supporters. Wallace died in England, November 8, 1913, the last of the ten great Victorians, who left their enduring impress upon the science and literature of the age.

THE QUIET OLD GENTLEMAN WHOSE TEACHING STIRRED THE WORLD

But he worked on in the same line, and produced almost as remarkable a book on the descent of man. Other great books dealt with the changes which come over plants and animals under domestication. Another gave us the wonderful history of the soil of the world, and another dealt with the life of the humble worm. Darwin's was a full life and a beautiful one. Everybody loved him; he was so simple and kind and generous and tender. Nobody could have believed that this shy and modest old gentleman could be the great Darwin who had stirred the mind of the whole world, and whom scientists regarded as greater than kings. When he died, in 1882, the nation mourned, and buried him with honors in Westminster Abbey.

Another great teacher of the nineteenth century was Herbert Spencer. His life began at Derby, eleven years after Darwin was born, and ended in 1903, twenty-one years after Darwin's. The two men were each the counterpart of the other. Indeed, Spencer was an evolutionist before Darwin was. Darwin was the great biological specialist; Spencer was the profound philosopher. He began life in a railway engineer's office, and probably would never have been heard of had not a time of disaster come to railways and driven him into journalism in London.

HERBERT SPENCER, THE GREAT THINKER WHO TOOK 40 YEARS TO WRITE A BOOK

His writings were always on the serious things of life, on government and social subjects. He was poor—very poor—and suffered all his long life from severe ill-health—sleeplessness, and all the unspeakable miseries which that misfortune carries. But, in spite of poverty and illness, he set himself to write a whole scheme of philosophy in ten great volumes. He gave himself twenty years in which to do the work. He was then nearly forty, and the work took him forty years to finish.

The books were not such as people would readily buy. They were dry, and hard to read, wonderful as they were as works of learning and reasoning. Three times in those forty years he felt that he would have to close the publication on account of his poverty, but thrice in the nick of time came legacies enabling him to carry it on, and at last the work was finished. By this time his fame was world-wide. His books were widely read in England and America, and with still greater interest on the continent of Europe.

His influence was especially strong in Russia, where the peasants have been making such efforts to obtain liberty and enlightenment. His books were translated into Russian, and it is said men would ride forty or fifty miles from village to village with a copy. All the villagers would gather together while someone read the book to them; then a rider would carry the volume on to the next village, so that Herbert Spencer became as well known by the peasants of Russia as he was in learned circles throughout the world.

JOHN TYNDALL, THE ENGINEER WHO BECAME A GREAT TEACHER OF SCIENCE

Two other great names stand out, and we must glance briefly at them. First, we have John Tyndall, physicist and philosopher and great teacher. The son of a policeman, he was born in Ireland in August, 1820, and died in Surrey in 1893. Like Spencer, he began life in a railway office, but after a term as tutor in a Hampshire college he saved money, and studied in a German university, and became famous as a scientific investigator and writer. He does not command attention in the way that Spencer and Darwin command it, for, though he made important discoveries in regard to the radiation of heat, about the formation, movement, and action of glaciers, and made valuable contributions to the science of electricity and biology, he was chiefly conspicuous as a great teacher, and as an expounder of the faiths of Darwin and Spencer.

He would have been a notable man for his work in the laboratory, but it was his eloquence upon the platform and his power of saying difficult things in easy language which made him so celebrated. Without Tyndall, Darwin and Spencer must have lacked one of their sturdiest

supports, and the British nation one of its best and clearest teachers.

Thomas Henry Huxley, with whom we close, was a kindred spirit of Tyndall, but his early days had been more like Darwin's, except in the matter of means. Huxley's parents were not in good circumstances, and the boy, who was born at Ealing in May, 1825, had a hard struggle for a medical education. He wanted to be a mechanical engineer, but had to be a doctor. So a doctor he became, but,

like Darwin, found fame on the sea. He had on the Rattlesnake an appointment similar to Darwin's on the Beagle, and, after voyages in two ships, came home with a fine collection of specimens from which he hoped to give the world new light on various points in biology. But he had no money with which to carry out his work, and, in order to get means with which to live, he was on the point of throwing aside his collection and going off again to sea, when, luckily, he was appointed lecturer in the Royal School of Mines. At last he was able to carry on his work and make his influence in science felt.

He had wretched health, but he had the courage of a lion, and worked when other men would have given up the fight. By diligent study he made himself one of the most lucid and attractive writers and speakers in England. He had wit,

he had lightning readiness, he had eloquence. Best of all, his soul was in his work, and he spoke not only from the abundance of his splendid brain, but from his heart. His value as a speaker and writer was never more apparent than when Darwin published his "Origin of Species." Critics fell upon it to rend it to pieces, but Huxley was superb, and turned the battle against the enemies of the man who was too shy to appear in public debate to face his fierce critics.

Huxley soon became the most famous popular lecturer on science of his day. His lectures attracted crowds, among them working men and the richest people in London. No man had more influence. One day he hailed a cab and bade the driver take him to a hall where he was about to lecture. Arrived at his destination, Huxley offered his fare, but the cabman would not take the money. "No, Mr. Huxley," he said; "your lectures have done me too much good for me to let you pay me my fare. It is an honor to have driven you, sir!" And Huxley accepted the compliment and passed to his lecture a happy man. Huxley lived for seventy years, and was one of the brightest figures of the nineteenth century, a man of spotless life, and of unselfish devotion to the service of his fellows, and to the great science that he loved and adorned so well.



BARON CUVIER EXAMINING AN EXTINCT MONSTER
Cuvier was one of the greatest scientists of modern times and had a marvelous intellect. He was the first to show the close relation of living animals to the extinct monsters, and here we see him at the Sorbonne in Paris examining fossil bones.

the compliment and passed to his lecture a happy man. Huxley lived for seventy years, and was one of the brightest figures of the nineteenth century, a man of spotless life, and of unselfish devotion to the service of his fellows, and to the great science that he loved and adorned so well.

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The Book of NATURE

WHAT THIS STORY TELLS US

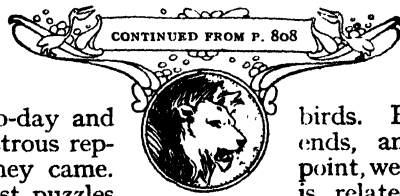
WE have read of the wonderful way in which the animals have been changed; how the gigantic animals of the old world passed away, and how the animals we know to-day have taken their place. Those animals that improved themselves, and made their lives fit the world around them, increased and prospered and developed; those that did not adapt themselves to the conditions about them died out. The animals that survived developed better brains than those that died, and mated with other animals of better brains, and the offspring of these had better brains still. Little by little, according to the theory of evolution, came new kinds of animals; those that did not improve, that could not keep pace with the changes in the world and the life around them, died out. Here we read of some of the links that still remain to show us how these wonderful changes in Nature were made, and we shall find them all most interesting.

ANIMALS THAT PUZZLE US

WE can still see living animals which form a link between the great animal family of to-day and that family of monstrous reptiles from which they came. These are the greatest puzzles alive. One of them is known as the duck-mole or the duck-billed platypus. When first white men got to know of it, they called it a long name, which meant bird-billed, broad-footed puzzle. With such a name as this, the animal is, as you may suppose, one of the most interesting in the world.

It lives in Australia and Tasmania. It has a body like an otter, but it has a bill or beak like that of a duck. It has webbed feet something like a bird, but in addition to the webbing it has strong claws, which enable it to dig its burrow, twenty or thirty or more feet deep, in the bank of the stream in which it swims and finds its food. It has the body of an otter, the beak and feet of a bird—and it lays eggs! Even that is not the most wonderful thing about it. When the eggs are hatched, the mother platypus pops the little ones into a pouch which it has on the under part of its body, and in that pouch the young ones are fed with milk.

Seeing that the platypus has the beak and feet of a bird, and, like a bird, lays eggs, you will naturally think that it must be some strange sort of a bird which has never learnt to fly. In some respects it is like a



bird. Some of its bones are very like those which should be found only in birds. But there the likeness ends, and, taking point by point, we find that the platypus is related not really to the birds, but to the reptiles.

Birds were once reptiles; so were nearly all living creatures of the earth and air. Some we can trace back through all sorts of changes, seeing how their forms vary, and how they came only gradually to the shape and size and character with which we are now familiar. But there seems to have been very little change in the platypus.

One feature it has which even a child would know marks it off from the birds and brings it close to the reptiles. All creatures which truly fly have very hot blood. The ordinary animals—horse, dog, lion, and so forth—have warm blood like our own; the blood of the Arctic fox, which lives in the cold, is very hot indeed, five or six degrees hotter than the blood of a man in good health. The seagull, which is always splashing in the cold waves, has blood which is two degrees warmer than ours; while the fast-flying little swallow has blood so hot that it would kill human beings if their temperature were as high. But the platypus, living always in a warm climate, has blood which is little warmer than that of the reptiles.

That at once shows it is allied to

the reptiles more than to birds or mammals. The platypus is from twelve to eighteen inches in length, and has a tail rather like that of the beaver, which is itself four or five inches long. It has thick, dark-brown fur; its ears do not show on the outside of its head, and it has small eyes. The bill is broad and horny, and contains, instead of teeth, hard bony plates. The male platypus has a sharp spur on the heel, but we are not sure what this is for.

THE PLATYPUS CARRIES US BACK TO WHEN REPTILES RULED THE EARTH

If caught on the land, the platypus curls itself up into a ball, like our friend the hedgehog, and it sleeps in this position, with one of its front paws placed across its beak. Its food consists of worms and water insects, which it gets at night out of the rivers and ponds in which it swims. Its home is in a burrow, which it digs by the bank of the river. There, in a rough nest, it makes its home and lays its eggs.

This, then, is one of the most mysterious links with the creation of the old, old days. It carries us back to the time when reptiles ruled the earth, and some men think it establishes a link with the times when there were no real land animals, but only amphibians—that is, animals which passed half their time on the land and half in the water.

The nearest likeness to the platypus is its cousin, the echidna, also Australian, and as wonderful as the platypus, but it has developed in a different way. Instead of fur, it has a covering of quills, like the porcupine. There is hair beneath, but the spines project, and can be made to stand upright when the animal is in danger. It has not a beak like the platypus, but a long, slender, beak-like snout, and no teeth. Its tongue is long and sticky, and is thrust out to catch the ants upon which the echidna lives.

THE LITTLE BEAST THAT BURIES ITSELF WHILE YOU LOOK AT IT

This curious beast has five toes on each foot, like a man or a monkey, but the claws are long and strong, so that the echidna can burrow into the ground with surprising speed. It can bury itself while you watch. Like the platypus, the echidna lays eggs, but it does not leave them in its burrow to be hatched, as its furry cousin does. When the echidna lays an egg it puts it into a pouch which

it carries, and keeps it there until the young echidna is hatched. There the baby echidna remains, nourished on the milk which the mother echidna gives it.

So far as the story of Nature can be read from the rocks, animals like the platypus and echidna originated from the beast-like reptiles, even before the birds were changing from other reptiles into creatures with fleshy tails and great teeth. From the creatures which were like the platypus came other mammals. The ant-eaters and porcupines perhaps descended from an echidna-like beast. After the birds came the animals which are called marsupials—that is, animals which have pouches upon the under-side of their bodies in which to carry their young. Several animals of this type remain to this day. They do not live in Europe, but in Australia and New Guinea, and in America.

The most famous of the marsupials is the kangaroo. That lives in Australia. The early marsupials reached Australia and New Guinea when those lands had not yet been cut off by the sea from the rest of the world. When the change came there most of them were in Australia, for the numbers in New Guinea are not such as to make them important.

HOW THE KANGAROOS CAME WHEN AUSTRALIA WAS CUT OFF BY THE SEA

They had the Australian continent to themselves. There were practically no great savage animals to fear. The struggle for life was not fierce as it afterwards became in other lands, where savage beasts could wander from country to country and from continent to continent, unstopped by the sea.

Gradually the marsupial animals of Australia became changed into the forms which we now know. They found that they could live better by leaping instead of running on all fours. Little by little the tail became longer and more powerful, to act as a support to the animal when it sat up. The hind legs grew longer and longer, while the fore legs grew shorter. The tail became not only a support in sitting, but a sort of lever, or third leg, when the animal was traveling. So to-day we have huge kangaroos—not as big as once upon a time they were, but still very large—which, when they stand upon their hind legs, balancing themselves on their tails, are eight feet high.

By the help of their long hind legs and their thick, long tails, they can make wonderful jumps. They do not run, but take flying leaps through the air, carrying them over the level at a wonderful rate, and making them able to leap obstacles which the finest horse could not clear. An ordinary kangaroo can leap a fence nine feet high, but some of them can clear fences which are eleven feet in height. They eat nothing but a diet of herbs, mainly grass.

When they had Australia to themselves they must have lived a happy, careless existence. But now that white men live in the land, with great flocks of sheep and herds of cattle to keep, the poor kangaroo, which has been there from days when perhaps man had not appeared upon the earth in his present form, has to suffer, as all wild animals which eat the food of cattle must suffer. They are hunted without mercy. Men hunt them on horseback, with powerful dogs specially trained for the work. They are shot, or poisoned, or driven into places barricaded so that they shall not escape. Then they are shot down. Their flesh is good to eat, and their hides make valuable leather.

The kangaroo, though it would never hurt anybody if it were left alone, fights bravely for its life when thus attacked. The big kangaroo, when chased by dogs, makes for any water that may be near, and stands up in the water. Here it waits for the dogs, and as they come near it forces them down with its fore paws, and holds them under water till they die. If it cannot escape by running, it will turn round and face its enemies. As a dog approaches, the kangaroo will

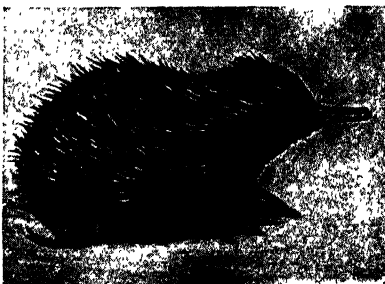
balance itself on its tail and, striking out with the sharp claws which it has on its hind feet, will tear open the dog which happens to be nearest.

It is very sad when the mother kangaroo is attacked. When her babies are born, tiny, helpless things, she puts them into the pouch which Nature has given her, and there lets them dwell until they are strong enough to run about and join her as she feeds. Sometimes the pretty baby, as the mother bends down to feed, will pop its head out, and, while nestling in the pouch, nibble away at the grass. But even when it grows older, and can come out and crop the herbage, it returns in an instant, if danger threatens, to its mother.

Up come the dogs, into its nest goes the little one, and away the brave mother rushes to save herself and her baby. The weight of the little one makes it hard for her to run; so, when she is tiring and sees the terrible dogs gaining on her, she will force the little kangaroo from its place in the pouch, and leave it on the ground. Then she will dart off in a new direction, so drawing the dogs after her, and leaving her baby safe. If she escapes, she returns by another way and recovers her little one. If she does not escape, she has given her life for that of her babe.

There are kangaroos at nearly all zoos, but there they live in small enclosures. There are some in Lord Rothschild's park at Tring, and in other parks in England, which live in freedom.

One evening one of the Tring kangaroos jumped over the park railings, and went scampering about the roads. A poor man who was tramping along



This is the echidna, which lays eggs and carries them in a pouch till hatched. It is thought all ant-eaters were once like this.



The duck-billed platypus, which we see here, has changed less than any other animal. It has the bill and feet of a bird, and lays eggs, but it has a body like an otter.

the roads saw a great figure in the gloom hopping towards him. Thinking that it was an evil spirit, he threw down his pack and ran away shrieking with fear. He never dreamed that kangaroos had been sent from Australia to Hertfordshire, and that this was one of their grown-up children.

THE LITTLE ANIMAL THAT WANDERS ALONG THE SEASHORE AT NIGHT

From the kangaroos that first grew from other forms in Australia many varieties have developed. There is the wallaby, which is smaller than the kangaroo, but in other ways the same. There is a kangaroo which lives in the trees, and is called the tree kangaroo. There is the kangaroo which lives among rocks, and is called the rock kangaroo. There is one so small that we call it the kangaroo rat. The kangaroos owe their existence to the fact that Australia was cut off by the sea from the rest of the world before the flesh-eating animals developed.

Most of the marsupials grew up in the same part of the world. Australia has a marsupial cat-like animal called the dasyure, which has a relation called the Tasmanian devil. The common dasyure, however, is not at all a ferocious monster. It lives on little animals, birds, and insects, and is said to find a good deal of food by wandering along the sea-coast at night.

Then there is a little animal called the Australian bear, or koala. It is not such a bear as you need fear—for it is small, and quite gentle. It carries its young in a pouch like all the rest of these animals, and when they are too old to ride that way, it climbs about the trees with its babies on its back. It lives almost entirely in the trees.

THE STRANGE SLOTH, WHICH SPENDS ITS LIFE LOOKING UP AT THE SKY

The koala is interesting because it is an animal that has grown different from the kangaroos, by walking instead of hopping. It seems a half-way step between the old, old animals of Australia and the bears and sloths of the newer creation. Though it has claws like those of the true bear, it sometimes hangs with its feet holding the bough, and with its back downwards.

That is what the strange animal called the sloth does. The ordinary sloth is about two feet in length, with very strong claws. It spends its life

looking up at the sky, which it sees through the branches of the trees to which it holds. Clinging to the boughs on which it feeds, it hangs back downwards, and goes from tree to tree. If by any chance it has to come down and walk upon the ground, it has the greatest difficulty in making its way, for its feet and claws are not adapted to such work. Through living so much among the trees, the sloth has become the color of the boughs among which it moves, and is very difficult to find.

The two-toed sloth lives in the West Indies, but there is one in South America which has three toes to each foot. This one is called the ai. The young of the sloth are carried about by their mother. They cling to her fur and ride securely as she climbs along the trees. The sloth has no pouch.

THE CUSCUS, WHICH HANGS ON A TREE BY ITS TAIL, AS IF DEAD

Now let us look at another tree-loving animal which has a pouch. This is the cuscus, an animal about the size of the cat, which lives in New Guinea and the Molucca Islands, and elsewhere, but not in Australia. The head and body are about eighteen inches long, but the tail is nearly as long as the head and body. This tail is a wonderful feature of the cuscus. Bare, except at the root, this tail is as good as an extra hand or foot to the cuscus. It winds round and clings to any branch or other object, and gives the animal a sure hold while it is seeking its prey. Should the animal believe itself to be in danger, it trusts everything to its tail.

It winds its tail round a bough, then, swinging downwards, hangs there, pretending to be dead. If we saw an animal hanging head downwards from the bough of a tree, we should quickly make a closer examination. But the cuscus has fur which looks just like the dry leaves of the trees in which it lives. Of course, it is larger than the leaves, but as the color is much the same as theirs it cannot be distinguished. If its form be noticed, any but an experienced hunter might think the living animal to be some big fruit hanging dead upon the branch.

This trick of pretending to be dead must save the cuscus from many a danger. There are other creatures which employ the same art. Birds and spiders

ANIMALS WHICH CARRY THEIR BABIES IN POCKETS



Here is a small kind of kangaroo which lives and feeds in the trees. It is one of Australia's animals. The wallaby, of which this is a photograph, is a pouched animal like the kangaroo, only smaller.



This is a kangaroo, which carries its babies in a pouch on the under-side of its body. It does not run, but hops and springs, with its hind legs and great tail. Because it eats grass which sheep and cattle need, the poor kangaroo is mercilessly hunted and killed. When attacked by dogs it will fight very fiercely.



This is a wombat, another animal which carries its babies in a pouch. It looks like a small bear.



Here is an opossum, the great pretender. If attacked it lies quite still and pretends to be dead.

The photographs in these pages are by Lewis Medland, W. P. Dando, Chas. Reid, and others.

are among the number. But the most striking example of all is the opossum. This is another of the animals which carries its little ones in a pouch. Perhaps you have heard people talk of "playing possum." The saying is a colloquial one for pretending. The opossum, who lives in the south, is a terribly hungry animal. It eats all sorts of vegetation, and, not satisfied with these, some kinds destroy large numbers of rabbits and poultry, and devour the farmer's fruits and grain. You will not be surprised, then, to learn that it is mercilessly hunted.

THE WONDERFUL OPOSSUM, WHICH BEARS PAIN THAT NO MAN COULD BEAR

Now, so long as it is in the trees the opossum is safe. It can hide, and it can cling with its wonderful monkey-like claws, and its clinging, twining tail. The tail is one of Nature's masterpieces. It is so strong and holds so surely that when the opossum is in a fruit-tree it can hang head downwards, and, holding only by the tail, can eat while in this position. Well, so long as it is in the trees, the opossum is fairly safe. But sometimes it is overtaken while on the ground. It cannot run very quickly, and dogs and men can come up with it. The animal then stretches itself out on the ground and pretends to be dead. You may beat it, you may throw water on it; you may do everything but actually kill it, and it will lie as still as a carved figure. Then, when you have done your worst, and have left it on the ground for dead, the little pretender will jump up and scuttle off home.

This is a wonderful thing. To hang as the cuscus hangs shows great cunning, but to lie and bear all the pain which the opossum bears at such a time is something no human being could do.

THE BABY OPOSSUM THAT HUNTS THE CRABS, AND THE INQUISITIVE RACCOON

The common opossum is about twenty-two inches long; its remarkable tail is another fifteen inches in length, and scaly, to enable it to grip the branches. But there is a tiny opossum, only six inches long, though the tail itself is seven inches in length. This one is curious for two reasons. It has not the true pouch for its babies' cradle as the kangaroos and other opossums have. It has a fold of skin, but not enough for the purpose. So the mother opossum puts

its babies on its back. They cling to her fur with their sharp little claws, then, when she curls her tail up over her back, they curl theirs up too, and cling with theirs to hers. Then away they go, pick-a-back, through the trees and woods, and down to the seashore and salt marshes, where the crabs are. Another little animal that eats crabs is the joker of our American forests, the raccoon—the coon, as southern people call it. Caught young, the raccoon makes a splendid pet. It is a most inquisitive animal, when tamed, and observes everything its master has.

When wild, it is a very different creature—shy, active, and a busy catcher of oysters and crabs and other shell-fish which it finds upon the seashore. Experience has taught it how to get the flesh of the crab from the shell without itself receiving a nip from the crab's strong claws. A curious habit of the raccoon is to dip its food in water and wash it before eating, pretending to do so when it has no water, in a very amusing way.

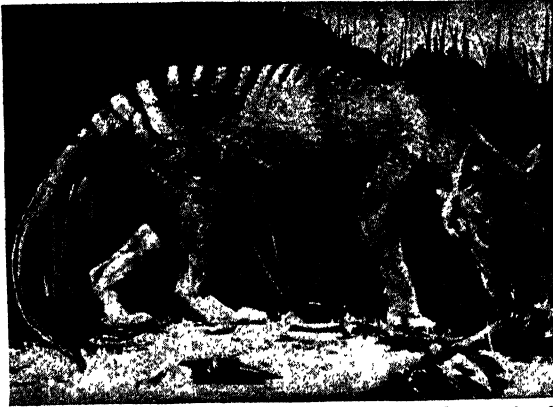
THE WOMBAT THAT GOES OUT BY NIGHT, AND THE RAT AS BIG AS A BOY

Two more of Australia's curious animals remain to be noticed. One is the bandicoot, and the other is the wombat. The bandicoot stands, perhaps, half-way between the kangaroo and the Tasmanian devil. It has a pouch for the young ones and cradle; it has teeth like a savage animal, and hind feet resembling a kangaroo's. It likes insects and worms, but it is also too fond of crops and roots for men to regard it as a friend. It is about eighteen inches long. There is a bandicoot rat, the biggest of all rats, but that lives in India, and is not a bandicoot at all. It is a great rat, which weighs from two to three pounds, and measures thirty inches in length.

The wombat is a sturdy, pouched animal, with powerful teeth and claws, which lives in its underground burrow all day long, and comes out to feed on grass and roots by night. It has the gnawing teeth of the rodent, but with its shuffling walk and the build of its limbs and body it resembles a small bear. The biggest living wombat measures about a yard from its snout to its tiny tail, but in the old days there were wombats as big as the rhinoceros.

THE NEXT NATURE STORIES ARE ON PAGE 1011.

SIX STRANGE ANIMAL LINKSWITH THE OLD WORLD



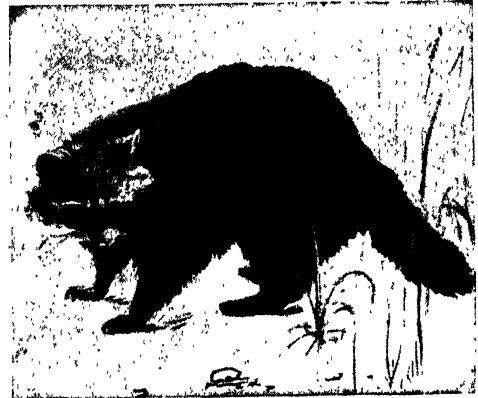
The Tasmanian wolf, which we see here, is a very fierce animal, which lives only in Tasmania. Like the kangaroo, it carries its young in a pouch, and this shows that it is not a true wolf.



This is a bandicoot, which is a link between the kangaroo and the Tasmanian devil. It eats herb-food and flesh and insects.



This is a very savage little animal called the Tasmanian devil. With its fierce courage and terrible teeth it is too much for any dog.



This is a racoon, one of our animals which lives in trees, but at night likes to go fishing for oysters and crabs. It makes a nice pet, but has a bad temper.

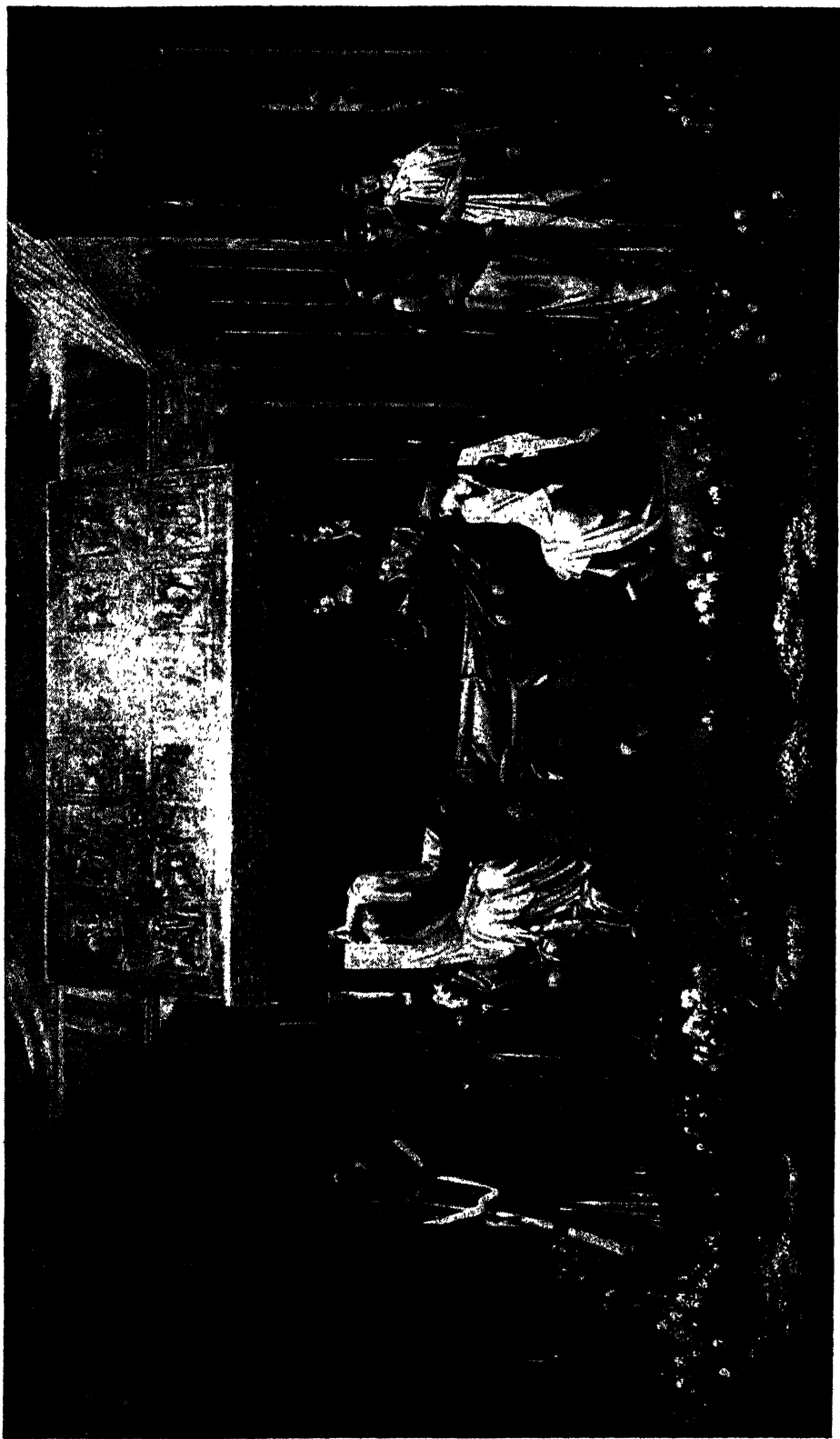


This is the pretty little dasyure, which is not savage like the Tasmanian devil. It lives mainly on fish and small animals.



Here is a three-toed sloth, a strange animal which lives upside down, hanging from trees, but can climb rapidly. Once there were giant sloths, as we have seen on page 56.

KING ARTHUR RESTING AT THE COURT OF THE TABLE ROUND



From the painting by Sir E. Burne-Jones ; photograph by Frederick Hollyer.

The Book of STORIES

THE STORY OF THE TABLE ROUND

ONE day as Caxton, the inventor of printing, sat by his press in Westminster Abbey, there came to him certain noble gentlemen asking how it was he did not print in a book the famous stories of King Arthur and his Round Table. It seemed to these good men that, after the Bible, the legend of Arthur should be the first book printed, for to them these tales of a great British chieftain were true as gospel. Glad are we that Caxton listened to this request, for by his book we now know the beautiful and mystic legend. These stories have been told to children, and been the delight of all for centuries. They are England's share in the world's literature of Chivalry. The story is told here of the beginning of the Table Round and some of the deeds of Arthur's knights, and elsewhere in the book we shall find some further tales from this wonderful store of the earliest English legends.

KING ARTHUR AND HIS KNIGHTS THE COMING OF THE KING

ON a bright, crisp spring morning in Eastertide, some years after the Romans had withdrawn from Britain, there rode towards Westminster, on the banks of the Thames, a pleasing trinity of horsemen—an old, cheerful-faced knight named Sir Hector; his handsome young son, Sir Kay, only just dubbed a knight; and a beautiful fair-haired youth of a most noble and kingly bearing, who, nevertheless, seemed more to desire the good fortune and happiness of the other two than to consider himself.

As they rode merrily forward, a sudden vexation overspread the face of Sir Kay, and he reined in his horse, exclaiming, with all the annoyance of youth, "I have left my sword behind me!" Sir Hector laughed with a loud delight, for here was a young man riding to a tournament, who had thought most carefully of his little moustaches, his fine apparel, his spurs, and the accoutrements of his horse, but had forgotten his sword! Sir Kay, though he laughed, flushed under his father's banter, and he was glad when the noble youth at his side turned the current of laughter by announcing his intention of riding back to get the sword for Sir Kay.

Back rode this handsome youth, whose name was Arthur, glad to do a service for his friend; but, on coming to the house, he found it locked and silent, for every one of the attendants had pressed forward to the famous

CONTINUED FROM 800

tournament at Westminster. Arthur's brows clouded as he looked at the silent walls and the closed windows. What would his friend do at the tournament without a sword? What misery for him! What vexation! Never would Sir Kay hear an end of Sir Hector's banter.

As he mused in this manner it came to his mind that there was, in a field by Westminster, an extraordinary sword stuck so fast in an anvil that no man could move it. Stories had reached his ears about this sword ever since Christmastide—strange stories. Some even said that he who could draw the sword would be chosen rightful King of Britain. Arthur thought that, whether these stories were true or not, he would at least try to get the sword for his friend and half-brother, the bold, handsome Sir Kay.

As soon as this thought occurred to him he rode forward and came to the anvil, which was set in a stone, and, climbing thereon, lifted the sword easily from its cleft. He must have thought the story was an idle jest. For there stood the large anvil in the field, the Thames flowing by in the distance, and nowhere that his eyes looked could he see any man guarding the sword. It was evidently set there for a jest, and the ease with which it came from the anvil convinced him that the story, at least in its meaning, had been exaggerated. Cheerfully he rode forward and overtook Sir Hector

and his son. But Sir Kay, taking the sword with a bright word of thanks, turned it over, and his face became deadly white, and he questioned Arthur how he came by it. Arthur told him.

"Then am I," cried Sir Kay, with a loud voice, turning quickly to his old father, "King of Britain?"

Sir Hector grew very solemn, and demanded of his son how he came by that sword. Sir Kay told him. Then the old knight, raising his eyes to the boy Arthur, dismounted from his horse, and, bending his knee at Arthur's stirrup-leather, said, "Sir, I perceive that thou art my King, and here I tender thee my homage."

Sir Kay did likewise.

Then they rode to tell the Archbishop all that had happened. Strange must it have seemed to Arthur, who had taken the sword to do another a kindness, that this simple little act of friendship and love had made him King of Britain. But Arthur did not know the story of his birth. All he knew was this—that he had grown up side by side with Sir Kay under the roof of the brave Sir Hector, that they had been like brothers together, and that always Sir Hector had treated him with love, and yet withal a certain restraint, as though to do him reverence.

How the boy Arthur came to live in the house of Sir Hector may be briefly told. The father of Arthur was one Uther Pendragon, King of Britain, and this King loved a lady who cared not for him, and would not be his wife. There came to him Merlin the Wizard, who said to the King, "Grieve not, Pendragon, for I will give this lady to you; but first swear to me by your honor that the son which shall first be born to you you will give to me." The King promised. Then Merlin gave to the King a change of aspect which pleased the disdainful lady, and she became his Queen. And when the son was born, named Arthur, the King gave him to Merlin, and the Wizard took

the child and carried him to Sir Hector, and bade the good knight bring up the child with the little Kay.

Now, why did the wise Merlin do this? Because he knew the trouble that was coming. Uther Pendragon died, and immediately there was rebellion and riot in the land, the nobles fighting against each other, and in their pride trampling down the crops of the peasants and slaying so many good men that the whole kingdom was brought to waste and ruin. The little Arthur would certainly have been killed had he been found on the Queen's knee. But Merlin waited, and when Arthur was grown to man's estate, and was kingly enough to take and keep his kingdom, then Merlin went to the Archbishop and bade him call to Westminster at Christmastide all the barons and knights of that realm, that they

might pray Heaven for peace and deliverance from ruin, and there should be seen a great marvel.

And it came to pass when the great nobles came forth from the Abbey on Christmas Day that they beheld an anvil set on a stone, and in the anvil, as though a giant's stroke had cleft it there, a sword strong and mighty; and they approached and saw written on the stone:

"Whoso can draw forth this sword is rightful King of Britain born."

All the barons rushed greedily to wrench out the sword, but each man failed, and was astonished and angered. Then said the Archbishop that there should be held a great tournament at Eastertide, and then, once again, the barons and knights should tug at the sword for the crown of Britain.

Imagine the surprize and indignation of the great, fierce barons when they learned at Eastertide from the Archbishop how that Arthur had drawn the sword easily, no man seeing him, and that he was rightful King of Britain. They roared their dissatisfaction. "Let



us see it done with our own eyes," they said. "If he pulled it out, let him press it back and do it again."

So they all rode back to the anvil set on a stone, and he who had ridden so humbly to the tournament, almost as the squire of Sir Kay, now found himself the centre of a dense mass of men, all their eyes gazing upon him.

The spring sunshine fell upon his fair hair, and the people, seeing him on the stone—young, beautiful, and strong, with the sword in his hand and his eyes bent upon them—felt a strange stir in their blood. And they were glad, so glad that their cries of "Arthur is

King!" rent the air when he forced back the sword and drew it forth again as if it were a withy from the stream.

Yet were the barons not satisfied. "What this boy can do a man can do," they argued. And the sword was put back, and one by one the barons wrenched at it, but in vain.

Then at last they acknowledged Arthur as their King, and the Archbishop set the crown upon the fair head of the young man, and the people filled those happy Easter skies with their shouting, for the face of Arthur was like a blessing, and from his eyes there seemed to fall a healing peace upon the wounded land.

THE FOUNDING OF THE KINGDOM

THE COMING OF THE QUEEN AND THE MAKING OF THE ROUND TABLE

SCARCELY had Arthur promised peace to his land, when a number of Kings, who swore they would never acknowledge this magic-chosen monarch as a rightful King, linked their forces and came up against Arthur in battle.

So Arthur, who longed to give his people peace, was obliged to fight, and two good Kings of Gaul, Ban and Bors, came to his aid, and he fought with his enemies and overthrew them in a mighty battle. But now, once again, he was unable to devote his days to peace, for Ban and Bors begged him to bring his army to their rescue in Gaul, where they themselves were threatened by enemies. So Arthur went with his allies and fought with them. Glad was he, indeed, when the war was over, and he returned to his own land.

But what a kingdom it was! War had trampled it into the likeness of a wilderness: the forest had spread itself out and conquered the tilled fields; weeds, rank and gross, grew in the gardens; the huts of the peasants were in ruins; and, worst of all, misery had so worked in the hearts of the people

that they had turned against God and were living fierce, evil, and barbarous lives. In those days the woods were full of robbers. Ladies dare not walk beyond the end of the street. Murder lurked behind every bush. Every man's

hand was against his brother, and every man considered not the welfare of others, but his own.

Arthur looked with sorrow on this degraded land, but not with despair. He knew that there is in all men good, to which a good man may always safely appeal. So he proclaimed a reign of justice and love; and he cut broad roads through the dense forests, and he called upon the strong to protect the weak, and bade every man who called him King to honor women and little children. The peasants rejoiced in these commands, and the land once more began to smile under the hand of husbandry; but still there were many who loved violence for its own sake, and others who robbed and murdered because they hated to work.

At this time Arthur fell in love with the most beautiful princess in the world, Guinevere, only daughter of King Leo-



degran, who reigned in Cameliard. He told Merlin the Wizard of his great yearning for this exquisite lady, and Merlin was sad. Arthur questioned him of his sadness, but Merlin said sorrowfully that it was in vain to try and turn the tide of a man's passion; Arthur must have his way, yet must evil needs come out of this marriage.

Arthur was too hot in love, and too flushed with the joy of his young kingship, to listen to these twilight warnings of the old man. Very joyfully he rode out to meet the lovely Guinevere, and at Canterbury, where the marriage was to take place, he made a great feast, and there he set up what is called the Round Table, and called to it all valiant and gentle men who would stand round their King and protect the weak and punish the tyrant. And chief among those at the King's side was the peerless knight, Sir Lancelot of the Lake, who had brought Guinevere to the King.

And this is the history of the Round Table. Merlin made it for Uther Pendragon, and at the death of Uther Pendragon it passed to King Leodegran, who held it in high esteem. But when Guinevere, his daughter, rode forth with Sir Lancelot of the Lake to marry Arthur at Canterbury, Leodegran sent to the young King this huge table which had once been his father's, as the next best gift he could give after Guinevere, his lovely daughter. And so Uther Pendragon's table became Arthur's table.

Now, at the marriage feast, when Arthur called brave men to his table, it was no mere act of amusement. With high pomp and gorgeous ceremony he

called his knights. He made them as knights servants of Christ the King.

He bade them consider themselves as the soldiers of the Perfect Christ; and he explained to them his high and noble purpose, which was to rule Britain by his order of chivalry, by the Knights of his Round Table. They were to go forth, armed and vigilant; they were to ride up and down in the land, punishing tyrants and evil men, helping the poor and needy, succoring the weak and defenceless, and turning the hearts of all men to Christ and the King.

Thus, in the good providence of God, Britain should have peace, and the blessings of Heaven light upon the lovely isle for ever.

We wonder what the gracious and lovely Queen thought of King Arthur as he spoke to his knights, and as they one by one came and knelt before him. She must have admired his beauty; she must have felt the magic in his words; she must have seen the power in his soul; but did she feel love for him? Alas, this lovely Queen, smiling at Canterbury upon the first act of the King's chivalry, was to be its ruin and disgrace. The dream of the great King was to be shattered by the beauty of the Queen.

Perhaps at that grand ceremony Merlin did not look either at the King or at his kneeling knights, but only at the Queen. Did their eyes meet, we wonder—the young Queen's and the old prophet's? And if so, did Guinevere flush and look aside, avoiding the eyes both of Merlin and Sir Lancelot?

THE CHALLENGE OF THE KING

AND THE FIGHT WITH SIR PELLIMORE IN THE FOREST

SO gay and cheerful was King Arthur that he would often ride out alone and unkingly into the forest, seeking an adventure after the manner of his knights, who went about redressing wrong.

And it chanced one day, as he rode in the forest Perilous, that he encountered a wicked knight who for the mere joy of fighting mounted guard over the path, permitting no man to go past. This

wicked Sir Pellimore challenged the knight approaching him, and Arthur gave him battle, veiling his kinghood. The two horses crashed together, and both horsemen came to the ground. Sir Pellimore was mighty above every man at that time, and he splintered the King's shield and broke his sword. But Arthur rushed at him, and, seizing him about the middle, hurled him to the ground. Yet did Sir Pellimore cling to him, and

would have done him some harm if Merlin had not come and thrown him into a deep sleep. When he aroused and knew that he had fought with the King, Sir Pellimore was sore afraid. But Arthur forgave him, and accepted him as a Knight of the Round Table, so that Sir Pellimore forsook his evil ways and fought only for the honor of Christ and the King.

The King went on with Merlin, and they came to a deep lake in the midst of the forest. And Merlin stayed the King, and they went to the edge of the water and looked across it. And as they looked a wondrous arm came from the centre of the lake, and in the hand was clasped a sword. Then Arthur saw a little boat by the lake, and Merlin bade him enter it, and go out upon the water and take the sword. So Arthur did as the wizard told him, and returned with the sword.

Then Merlin pronounced its name "Excalibur," and told Arthur that it was the mightiest sword on earth, and

that upon the hilt was engraved on one side, "Keep me," and on the other, "Throw me away." He bade Arthur keep it carefully, for the time was not yet when he should throw it away.

And this sword, in the hand of the King, became mightiest in Christendom, and its fame has lasted unto this day.

No man could stand before Excalibur, and the glory of the King increased. Yet never once used he Excalibur in an evil cause, nor encouraged the Brotherhood of his knights to love fighting save for noble ends.

And his knights were like, as it were, his apostles; they took from him the glory of his soul, and carried chivalry into all the length and breadth of Britain, so that there was no land so honored and so happy as Britain, and no knights in all Christendom so famous for pure lives, great valor, and exceeding courtesy as King Arthur's Knights of the Round Table. Gloriously in those days did the sun shine upon the green fields and waters of Britain.

THE VISION OF SIR GALAHAD

AND HOW THE YOUNGEST OF THE KNIGHTS FOUND THE HOLY GRAIL

NOW, the knights of King Arthur had each one his own seat at the Round Table, and on every seat the name of the knight was carved.

But there was one seat called the Perilous, which had no occupant, none daring to sit in it, and over the name, which no man knew, there was always a covering.

One day, as the King and his knights sat together, there entered the great hall an aged knight, followed by a most beautiful young man. The old knight advanced to the seat called Perilous, and pointed to the young man that he should sit there. When his command was obeyed, the old man bent over the youth, kissed him, and departed.

Much amazed was the King, and asked the young man his name.

"I am called Galahad," said he.

Then the King raised the cloth on the seat, and lo! the name written there was "Galahad."

Now, Galahad was the youngest of the knights, and not so strong a man as the others; but there was such majesty in his eye, such purity in his brow, and

such sweetness on his lips, that the others felt for him a great reverence, and he was treated even by the King with high honor.

One evening, as the knights sat together, the King being absent, a good and happy young knight, named Sir Percivale, entered the hall with a wonderful story.

He had been to see his sister, who was a nun, and this sister had told him how one night, as she lay sleeping in her cell, she was suddenly awakened by most sweet music, and, opening her eyes, saw a broad shaft of moonlight streaming through her window, in the midst of which floated and throbbed like a beating heart the sacred chalice out of which our Savior drank the wine at the Last Supper—the sacred cup, called by all men the Holy Grail.

The knights started up at the tale. This Holy Grail, so ran the legend, had been brought to England by that good Joseph of Arimathea, who laid our Savior in the sepulchre from which He rose triumphant on the earth's first Easter Day.



KING ARTHUR
He rode a simple knight among his knights,
And many of these in richer arms than he.

The Holy Grail had once been venerated in England, but suddenly it had vanished—some said because of the evil in the land—and, after searching for it up and down the kingdom for a long time, men at last had ceased to think about it. But now the vision had appeared again.

Among the knights to whom Sir Percivale's story came with great power was Sir Galahad. His face declared how deeply he was moved. Sir Percivale, looking upon him, saw that the expression in Sir Galahad's eyes was like that which he had seen in the eyes of his sister, and it came to him that Sir Galahad should go and see the nun, and speak to her about the Holy Grail. If man was to find the Cup, it would be this pure and noble youth.

So Sir Percivale took Galahad to the place where his sister lived, and as soon as the nun saw Galahad she knew that he was to be Knight of the Holy Grail. Then the beautiful nun cut from her head all the lovely hair that adorned it, and made a girle of these gleaming tresses, and bound it about Sir Galahad's waist, and fastened his sword to it, and charged him with the holy mission. He was to pray often ; he was to go forth doing good, and, after the vision of the Holy Grail was vouchsafed to him, he was to journey to a far-off city where the people would crown him King.

Sir Galahad obeyed the nun. He was not the only knight who went forth in quest of the Holy Grail, for the story of the nun had fired the imagination of all the knights at King Arthur's Court, and Britain now witnessed the dispersal of these brave men in quest of the sacred Grail. But Galahad was the only knight whose heart was pure,

and it was to Galahad that the vision came.

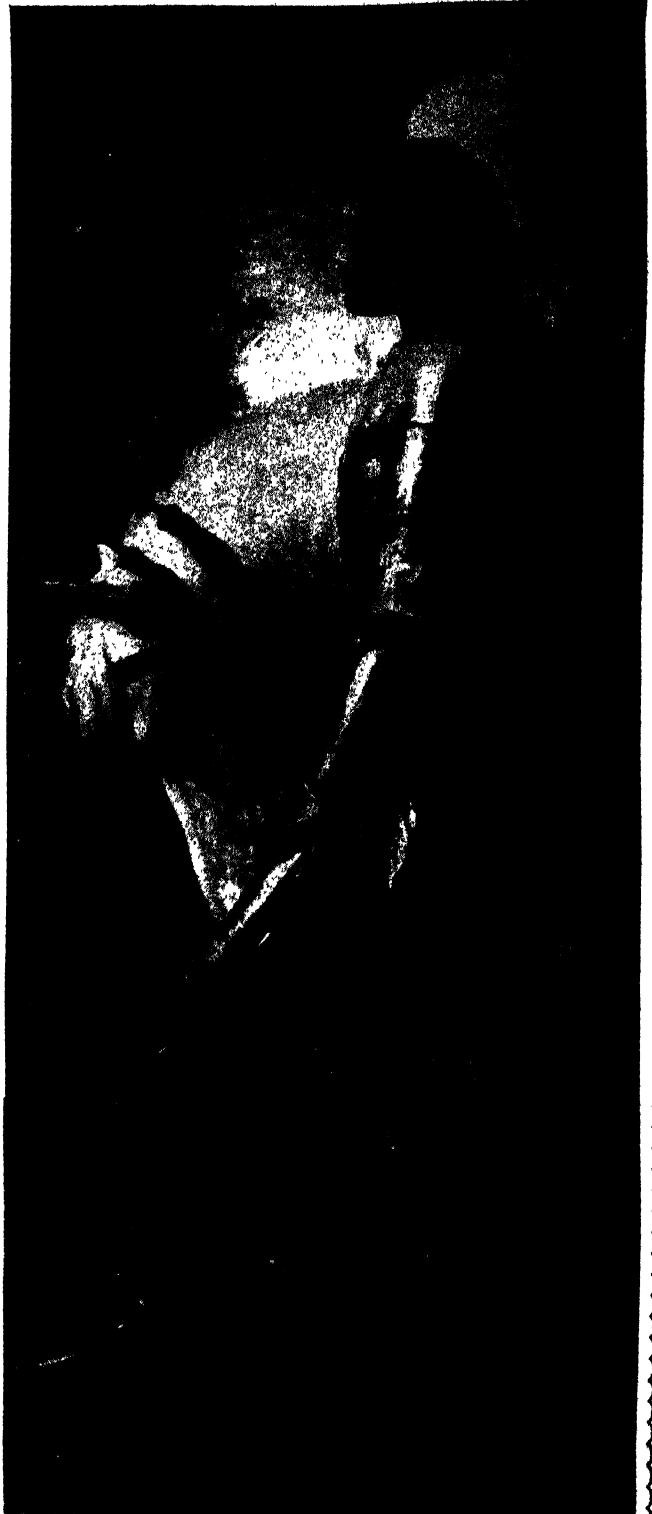
On his long journey he fell in with his old friend Sir Percivale, and Sir Percivale confessed that not yet, in spite of fastings and prayer, had he seen the blessed vision. Then Galahad told Percivale how the vision was always before him, and how it had led him from victory to victory, and how no man could stand against his spear.

"But you, too, shall see the vision," he concluded, "for I am about to go to a far city, and at the moment of my departure you shall see the Holy Grail."

The two knights traveled forward on their horses. Sir Galahad carried on his left arm a white shield with a scarlet cross, and his great war-horse, with its crisping mane and long, flowing tail, was as white as milk. They rode silently, as men engaged upon some absorbing quest. Sir Galahad's eyes gazed straight before him, with a strange light in them. Sir Percivale glanced often at Sir Galahad. He was like a man who had looked upon the face of Christ.

Towards nightfall they reached the wide-stretching marshes, and heard in the far distance the roll of the surf. As they urged their horses into the gloom overhanging the marshes, they saw rising up before them, and stretching forward on pier after pier to the well-nigh invincible ocean, a vast and towering bridge. Sir Galahad's eyes lighted at sight of this bridge, a smile illumined his pale face, and with one bound he was upon the bridge, and clattering upward and forward.

Sir Percivale reined in his horse. He dared not follow. For as Sir Galahad reached the first pier it sent up into the night-sky a tongue of scarlet flame, and the second pier did



Painted by G. F. Watts, R.A.

Photograph by Fredk. Hollyer.

SIR GALAHAD
His strength was as the strength of ten,
Because his heart was pure.

the same, and the third, till the whole bridge over which Sir Galahad had passed was a great, sweeping mass of fire. But Sir Percivale, waiting in the darkness on his startled horse, had his reward. Just as Galahad reached the sea, the whole sky was filled with the anthem of heaven, a mighty city of pearl-white towers and pinnacles disclosed itself above the ocean.

And over this city into which Sir Galahad was entering, swimming in a mist of everlasting beauty, appeared the Holy Grail.

Sir Percivale bowed his head upon his breast, and in that moment, so sacred, so wonderful that no language can describe it, vowed his life to the service of God and the love of Christ.

THE GOLDEN BIRD IN THE KING'S GARDEN

A CERTAIN King had a beautiful garden, and in it stood a tree which bore golden apples. About the time when the apples grew ripe, it was found that every night one of them was gone.

The King became very angry at this, and ordered the gardener to watch all night. The gardener set his eldest son to watch; but about twelve o'clock he fell asleep, and in the morning another of the apples was missing. Then the second son was ordered to watch; and at midnight he, too, fell asleep, and in the morning another apple was gone.

Then the third son lay down under the tree to watch. As the clock struck twelve a bird of pure gold came, and as it was snapping at one of the apples the gardener's son shot an arrow at it. But the arrow did the bird no harm; only it dropped a golden feather from its tail, and then flew away.

The golden feather was brought to the King in the morning. Everyone agreed that it was worth more than all the wealth of the kingdom; but the King said, "One feather is of no use to me; I must have the whole bird."

Then the gardener's eldest son set out to find the golden bird, and when he had gone a little way he came to a wood, and he saw a fox, and was going to shoot it. But the fox said:

"Do not shoot me, for I will give you good advice. I know that you want to find the golden bird. You will reach a village, and you will see two inns opposite to each other, one of which is very beautiful to look at. Do not go in there, but rest for the night in the other."

But the son took no notice of the fox, and when he came to the village he went into the smart house, and ate and drank, and forgot about the bird. Time passed

on, and, as the eldest son did not come back, the second son set out, and the same thing happened to him.

The youngest son then went to seek the golden bird. As he came to the wood he met the fox, and heard the same good advice. But he was thankful to the fox, and did not try to shoot him, and so the fox said, "Sit upon my tail, and you will travel faster."

So he sat down, and the fox began to run, and away they went, so fast that their hair whistled in the wind.

When they came to the village, the son went to the shabby inn, and stayed there all night. In the morning the fox came again and said:

"Go straight forward till you come to a castle, before which lie a whole troop of soldiers fast asleep. Take no notice of them, but go into the castle and pass on till you come to a room where the golden bird sits in a wooden cage. Close by it stands a beautiful golden cage; but do not try to take the bird out of the shabby cage and put it into the handsome one."

Then the fox stretched out his tail again, and away they went.

Before the castle gate all was as the fox had said. So the son went in and found the chamber where the golden bird hung in a wooden cage, and below stood the golden cage, and the three golden apples that had been lost were lying close by it. Then he thought:

"It will be an odd thing to bring away such a fine bird in this shabby cage."

So he took hold of it, and put it into the golden cage. But the bird set up such a loud scream that the soldiers awoke, and took him prisoner. The next morning the Court sentenced him to die, unless he should bring the King the golden horse which could run as swiftly as the



THE YOUNG MAN RODE ON THROUGH THE WOOD WITH THE PRINCESS AND THE GOLDEN BIRD AFTER LISTENING TO THE ADVICE OF THE FOX

wind, If he did this, he was to have the golden bird for his own.

So he set out once more on his journey, when the fox met him and said:

"You see now what has happened through not listening to my advice. I will, however, tell you how to find the golden horse. You must go straight on till you come to a castle where the horse stands in his stall. By his side will lie the groom fast asleep. Take away the horse quietly, but be sure to put the old

leathern saddle upon him, and not the golden one close by it."

Then the son sat down on the fox's tail, and away they went. All went right, and the groom lay snoring with his hand upon the golden saddle. But when the son looked at the horse, he thought it a great pity to put the leathern saddle upon it.

"I will give him the good one," said he. "I am sure he deserves it."

As he took up the golden saddle the

groom awoke, and called out so loudly that all the guards ran in and took the young man prisoner, and in the morning he was again brought before the Court and sentenced to die. But it was agreed that if he could bring thither the beautiful Princess he should live, and have the bird and the horse given him.

Then he went on his way again very sadly; but the old fox came and said:

"Why did you not listen to me? But I will once more give you advice. Go straight on, and in the evening you will arrive at a castle. At twelve o'clock at night the Princess goes to the bath-room; go up to her and give her a kiss, and she will let you lead her away; but do not allow her to take leave of her father."

As they came to the castle, all was as the fox had said, and at twelve o'clock the young man met the Princess, and gave her a kiss, and she agreed to run away with him, but begged with many tears that he would let her take leave of her father. At first he refused, but at last he consented; but the moment she came to her father's house the guards awoke, and took him prisoner.

Then he was brought before the King, who said, "You shall never have my daughter unless in eight days you dig away the hill in front of my window."

Now, this hill was so big that no one could take it away; but when he had worked seven days, and had done very little, the fox came, and said:

"Lie down and go to sleep, and I will work for you."

In the morning the hill was gone.

Then the King was obliged to keep his word, and away went the young man and the Princess, but the fox came and said to him:

"We will have all three—the Princess, the horse, and the bird. When you come to the King, and he asks for the beautiful Princess, you must say, 'Here she is!' Then you will mount the golden horse that they are to give you, and put out your hand to take leave of them; but shake hands with the Princess last. Then lift her quickly on to the horse and gallop away."

All went right, and then the fox said:

"When you come to the castle where the bird is, I will stay with the Princess at the door, and you will ride in and speak to the King. When he sees that it is the right horse, he will bring out

the bird; but you must sit still, and say that you want to look at it; and when you get it ride away."

This, too, happened as the fox said; they carried off the bird, the Princess mounted again, and they rode on to a wood. Then the fox came and said:

"Beware of two things: don't ransom anyone from the gallows, and do not sit down by the side of any river."

Then away he went. The young man rode on with the Princess, till at last he came to the village where he had left his two brothers. And there he heard a great noise; and when he asked what was the matter, the people said:

"Two men are going to be hanged."

As he came nearer, he saw that the two men were his brothers, who had turned robbers; so he said:

"Cannot they in any way be saved?"

But the people said "No," unless he would give all his money to buy their liberty. This he did, and they all went on till they came to the wood where the fox first met them. Here it was so cool and pleasant that they all sat down by the side of the river. Then the brothers came behind and threw him down the bank, and took the Princess, the horse, and the bird, and went to the King, saying, "We have won all this by our labor."

Then there was great rejoicing; but the horse would not eat, the bird would not sing, and the Princess wept.

The youngest son fell to the bottom of the river's bed. Luckily it was nearly dry, but the bank was so steep that he could not get out. Then the old fox came once more, and scolded him.

"Yet," said he, "I cannot leave you, so lay hold of my tail and hold fast."

Then he pulled him out and said:

"Your brothers are going to kill you if they find you in the kingdom."

So he dressed himself as a poor man, and came secretly to the King's Court, and when he came in the horse began to eat, and the bird sang, and the Princess left off weeping.

He told the King of his brothers' evil deeds, and they were punished; and when the King died the youngest son and the Princess ruled the kingdom.

A long while afterwards he met the old fox, who begged him with tears in his eyes to kill him. At last he did so, and in a moment the fox changed into the long-lost brother of the Princess.

THE FABLES OF ÆSOP THE SLAVE

THE WOLF AND THE CRANE

A WOLF, when eating his dinner one day, swallowed a bone, which stuck in his throat. He went howling about, asking every animal he met to help him, and promised a large reward to anyone who could get the bone out. At last a crane, who had a long, slender neck and bill, undertook the task.

Poking his long bill down the wolf's throat, he got hold of the bone and pulled it out; but when he asked for his reward, the wolf laughed and said, "You may think yourself lucky that



I did not bite your head off when it was in my mouth."

Some people are not grateful when anyone does them a kindness.

THE PROUD FROG

AN ox, grazing in a field, happened to put his foot down among a family of young frogs, and trod one of them to death. The others told their mother what had happened, and said that the animal that did it was the biggest creature they had ever seen.

"Was it as big as this?" said the old frog, swelling herself out in the curious way that frogs can do.

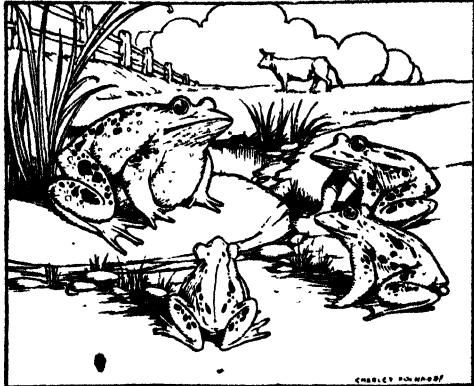
"Oh, much bigger than that!" said the little frogs.

"As big as this?" she asked, straining herself still more.

"Indeed, mother," they said, "you

would never be so big if you were to stretch till you burst."

Then the foolish old frog made another



effort to make herself still bigger, and she burst and died.

Never try to make yourself out to be a more important person than you are.

THE VAIN JACKDAW

A CERTAIN jackdaw was so vain and conceited that he was not contented with his plain black feathers. So he picked up a quantity of beautiful feathers that had fallen from some peacocks' trains, and fastened them carefully on his own back.

Then he tried to join the family of peacocks, as if he was one of themselves; but they soon found him out, and pecked him so hard that he was glad to run away.

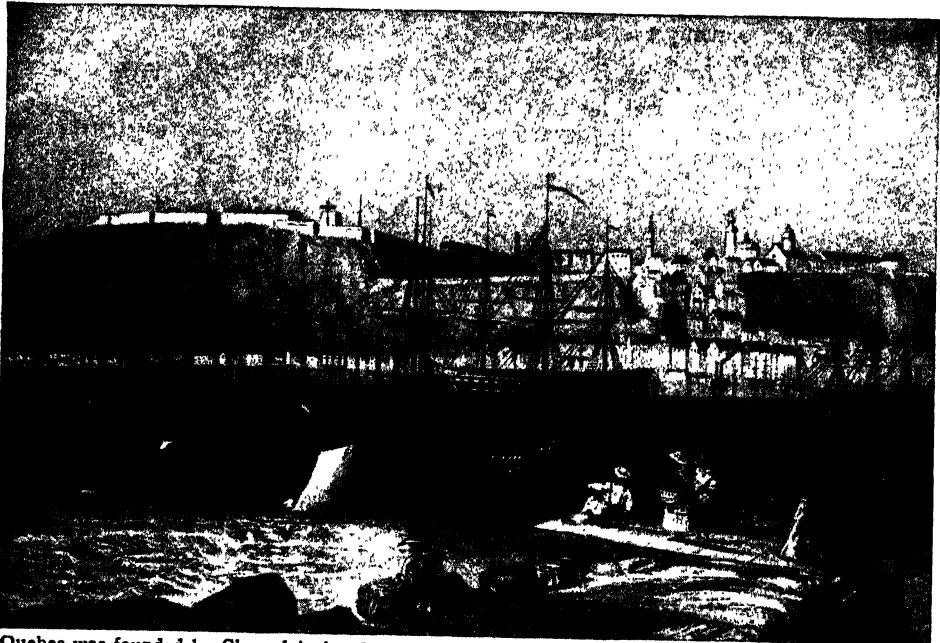
He then went back to his old friends, the jackdaws; but they drove him away, and would not be friends with him any more.



If we pretend to be better than we are, people will find us out.

THE NEXT STORIES ARE ON PAGE 973.

OLD QUEBEC AND ITS CAPTOR



Quebec was founded by Champlain in 1608, and after it had been fortified the French thought it could not be captured. When General James Wolfe was sent to take the town in 1759, he thought out a plan which proved successful. This was to move his troops up stream and climb the cliffs behind the city.



During the night of September 18, 1759, the troops scrambled up a steep path, and in the morning were ready for battle. The French General Montcalm attacked, but was defeated. Both he and Wolfe were fatally wounded. The city surrendered. As it was the strongest place the French had, peace was soon made, and France lost her American possessions. Not an acre of land was left her on the continent.

The Book of THE UNITED STATES

THE HISTORY OF THE UNITED STATES

WE have learned that Spain, England, France, Holland and Sweden all tried to plant colonies in North America, and that Sweden and Holland were forced out, leaving the three nations first named in possession. The Spanish colonies were in the far South, and continued to belong to that power for a long time, but we shall learn in this article how France and England struggled for the rest of the continent, and how France lost every foot of land she owned on the mainland. Canada and the territory she claimed east of the Mississippi went to England and the territory west of the great river was turned over to Spain. Only two tiny islands off Newfoundland were left to France.

THE STRUGGLE FOR THE CONTINENT

WE have already learned that Englishmen planted many colonies on the Atlantic coast from Maine to Florida, and that, while some were divided, others were joined together until at last thirteen remained. In the meantime France had not been idle, as we learned in the second article. They built forts and towns upon the St. Lawrence River, in Nova Scotia, which they called Acadia, and on the Great Lakes. They explored the Mississippi River down to the Gulf of Mexico and sent out many missionaries to try to make Christians of the Indians. Sweden and Holland had been forced to give up the colonies they had planted, and besides Great Britain and France, only Spain remained.

THE ENGLISH BUILD HOMES IN THE NEW LAND

But there was a great difference in the kind of colonies that were planted. The English built homes in the new country and expected to spend their lives in their new homes. In all their colonies most of the people cultivated the ground, though in some of them fishing was also very important, and the New England colonies built many small ships in which they carried dried fish and timber to other English colonies, or to the French and Spanish colonies, and even to Europe. England left the colonies very much alone at first and the people learned to govern themselves and to be proud of

CONTINUED FROM 789

their colony or province, as it was sometimes called.

The French colonies were generally sent out by companies which expected profits from the fur trade. They did not care whether the colony grew or not if they could get many soft furs which they could sell at a high price. Some wise men tried to settle permanent colonies, but they were not supported and the colonies did not grow strong as the English colonies did. Then, too, those in power in France sent out long lists of rules which had to be obeyed. The settlers had little liberty, and some pushed on into the Indian country where the rules could not follow them.

THE FRENCH COLONISTS EXPECTED TO RETURN TO FRANCE

Another great difference was this. English women came out from the first, and most of the settlers expected to live all their lives in the country. Very few French women came out, and many of the Frenchmen married Indian wives. Their children were more Indian than French and they did very little to build up the French power. The Frenchmen who did not marry expected to go back to France some day when they had become rich, and so did not do much to make the country strong. They lived in the woods like Indians and traveled far and wide—trapping animals, or buying their skins from the Indians.

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The French knew better how to make friends with the Indians than the English did. The English despised them and almost destroyed some Indian tribes such as the Pequots, the Tuscaroras, and King Philip's men, who were called Wampanoags or Pokanokets. Some of the colonies offered rewards for Indian scalps. The French were friendly with all the Indians except the Five Nations. You remember how Champlain's mistake cost the friendship of these warriors. An Irishman named Sir William Johnson, who lived in the Mohawk Valley, had more influence with them in later years than any one else and made them help the English.

THE JESUIT MISSIONARIES IN NEW FRANCE

One reason for the friendship of the Indians towards the French was the great number of missionaries who visited all the tribes. The most important were the members of the Society of Jesus, which is a society in the Roman Catholic Church, and they were called Jesuits. Father Marquette and Father Jogues were two of the best known. Many of these missionaries were tortured by the Indians, but as fast as one was put to death another stepped forward to fill the place, and at last their preaching had some effect, except with the Five Nations, who would not listen to them because they were French. As both powers grew in America the French determined to settle the Mississippi Valley, which they claimed because Father Marquette and La Salle had explored that great river. If they could build forts and place settlers in the valley, they could keep the English east of the Alleghany Mountains. If you will turn to your map you will see how narrow that strip of territory is when you compare it with the Mississippi Valley. Real fighting began in 1690, though the year before the governor of New York had stirred up the Five Nations to make a fierce attack upon the Canadian village of Lachine.

Spain was not so powerful as two hundred years before, and France and England were almost constantly at war trying to settle which was the stronger power in Europe, and fighting took place in America as well as in Europe. The first of these wars was known in this country as King William's War because William III was King of England at the time. A

party of French and Indians burned the town of Schenectady, New York, in 1690, killed 60 persons and took 30 prisoners. A small town in New Hampshire and a fort in Maine were also taken, and the people massacred. In 1690, however, the English and the New Englanders captured Port Royal in Acadia but failed to take Quebec. The Five Nations made many raids upon the French, and we tell of one of these in the story of Madeline de Verchères. At the end of the war each power gave back all the places it had taken.

THE BRAVE MRS. DUSTIN AND HER TERRIBLE EXPERIENCE

During this war a farmer named Dustin was at work in a field near Haverhill, Massachusetts, with seven of his children around him. When he heard the terrible war whoop one day, he seized his gun and kept the Indians back until he and the children reached a fortified house. At his own home, the Indians killed his baby by throwing it against a tree, and took Mrs. Dustin and another woman with them. A white boy, who was also a captive, told Mrs. Dustin that they were all to be tortured when the party, which was made up of nine men and boys and three squaws, reached the end of the journey. One night when all the Indians were asleep, Mrs. Dustin, the other woman and the boy very quietly got hold of tomahawks and killed ten of their captors. One squaw and a boy escaped. Then Mrs. Dustin scalped the ten Indians, and the three made their way back home, over a hundred miles through the forest. The government paid Mrs. Dustin a large sum of money for the scalps.

QUEEN ANNE'S WAR GIVES ACADIA TO ENGLAND

The war which broke out again in Europe in 1702 was called in America Queen Anne's War, and many towns were captured by the French with the aid of the Indians. At Deerfield in Massachusetts, in 1704, 60 whites were killed and 100 were captured. If any of the captives could not keep up as they were being taken away, they were tomahawked and scalped. Later some of the Deerfield captives were ransomed, but others had been adopted into the tribe, and had grown to love the life in the wilderness so much that they refused to return to their families.

THE STRUGGLE FOR THE CONTINENT

Haverhill was also attacked by the French and Indians and many people were killed. Later, in 1710, the English captured Port Royal again, and named it Annapolis in honor of the queen. At the end of the war (1713) the town was kept by the English, and all Acadia, or Nova Scotia, as well, besides the country around Hudson Bay. France had now lost much territory, but was still powerful in America. In this war there was also some fighting between South Carolina and Florida, as Spain was helping France.

There was no open war between the

under William Pepperell sailed to attack the fort in 1745, and with some help from a British fleet, took the fort and gained a large stock of powder and other ammunition. This was a very important event, for it showed how the English colonists could fight. The fort, however, was given back to France when peace was made at Aix-la-Chapelle in 1748.

By this time the English colonists were beginning to think that they would soon need the land across the Alleghany Mountains. The English kings had granted to Virginia, Massachusetts, Connecticut and Carolina the land from sea to sea, and the



ESCAPE OF THE DUSTIN CHILDREN

A farmer named Dustin was working on his farm near Haverhill, Mass., with his children around him when he discovered the Indians. He seized his gun and was able to keep them back, while he and the children retreated. You may read of what happened to his wife and of her brave deed on the opposite page.

French and English for more than thirty years now, though the people of New England believed that the French encouraged the Indians to make attacks upon the careless settlers. The war which was being fought in Europe finally reached America in 1744, where it was generally known as King George's War.

KING GEORGE'S WAR PROVED THAT THE COLONISTS COULD FIGHT

The French had built a very strong fort at Louisbourg, on Cape Breton Island, and thought it could not be taken. A force of about 4,000 New Englanders

grant of Pennsylvania extended beyond the mountains. New York also claimed some of the western lands. Though the waters of Lake Champlain flowed into the St. Lawrence River, the lake itself and the land around it were easier to reach from the English colonies than they were from the French. The English wished to settle the land, but the French wished to keep it open and uninhabited for the sake of the fur trade. Settlers always make the wild animals scarcer. Everybody realized that peace could not last long and both sides prepared for a fight.

THE DIFFERENT CLAIMS TO THE VALLEY OF THE MISSISSIPPI

In the valley of the Ohio River was much game but few Indians lived there. Pennsylvania claimed a part of the land, and Virginia also said that it was a part of the territory which had been granted by James I. The French said that since the Ohio flowed into the Mississippi, all the land belonged to them because of the voyages of La Salle. In those days a nation which occupied the mouth of a river always claimed all the land from which water ran off into that river or any of its branches.

The French began in 1749 to send men all through the region to raise the French flag and to bury lead plates on which were the royal arms of France. The same year, the Ohio Company was formed by a number of wealthy Virginians, and it was their plan to settle a fourteenth colony along the Ohio River. Lawrence Washington, the elder brother of George, was one of the managers, and in 1750 much of the land was surveyed in what is now western Pennsylvania and West Virginia.

The French began to build forts in the region. The place where Pittsburgh now stands seemed important to both parties and a few English settled in the neighborhood, but did not build a strong fort, as it was claimed by both Pennsylvania and Virginia, and neither colony wished to spend money on a fort which might be given to the other. When Governor Dinwiddie, of Virginia, heard of these new French forts, he sent a messenger to warn the Frenchmen that they must leave Virginia territory. This messenger was George Washington, and in another part of our book you may read of his terrible journey through the forest.

A NEW AND IMPORTANT FIGURE APPEARS IN AMERICA

The commanders of the French forts were very polite but they said they could not think of leaving without orders from the government of New France in Montreal, and then almost immediately the French began to build a strong fort on the place where Pittsburgh now stands, and called it Fort Duquesne. Governor Dinwiddie sent some Virginia troops to drive away the French in 1754. The commander became sick, and George Washington, the second in command, took charge. Roads had to be cut

through the woods in order to get the cannon and the wagons along, and sometimes the little army did not advance more than a mile or two in a day.

When they had crossed the mountains and had reached a place called Great Meadows, they met a small French force, ten of whom were killed and twenty-two were captured. While waiting for other troops to come to his assistance Washington built a rude fort which he called Fort Necessity. The troops came and Washington's force now amounted to 300 whites and 150 Indians, who were under a chief called Half-King. There were now about 1,400 French at Fort Duquesne, and 600 of them marched to find Washington. The Virginia forces had very little powder, and after it was gone they surrendered, but were allowed to march away. Half-King did not think very highly of such war and said that the French acted like cowards and the English like fools.

War had not yet been declared, but both nations at once sent troops to America. General Edward Braddock with about a thousand English regular troops reached Virginia early in 1755. The plan was made to attack the French in four places at once. They were at Fort Duquesne, on Lake Ontario, on Lake Champlain and on the border of Acadia, which was at this time a British possession. General Braddock was to take Fort Duquesne.

A BOASTFUL ENGLISHMAN COMES TO GRIEF

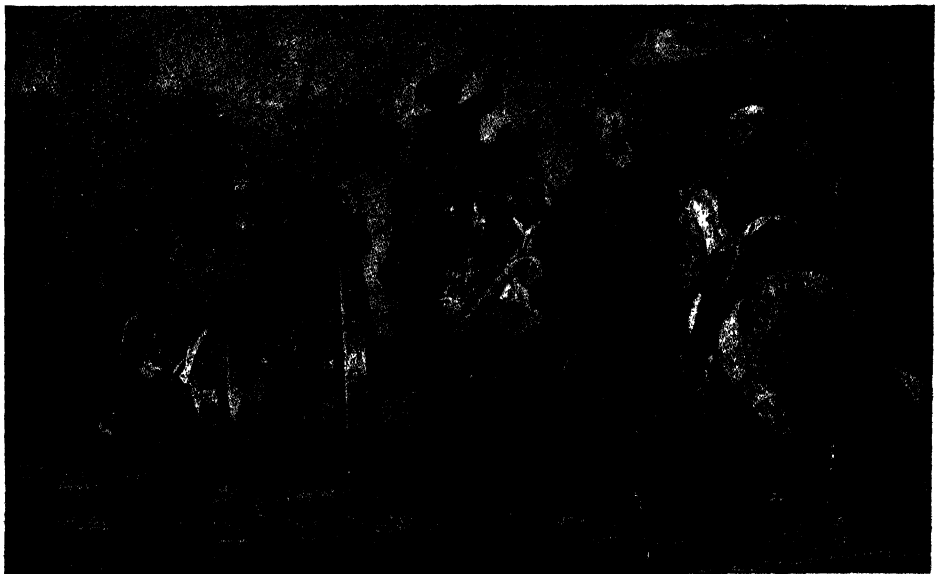
Besides his British troops, nearly 500 Virginians were with Braddock when he started on the march, but he did not care much for these nor for the help of the Indians. He knew nothing about fighting in the woods and thought that his trained troops were worth more than any others. When Benjamin Franklin tried to warn him of the dangers he would meet he answered that the Indians might make trouble for the raw militia, but that they could make no impression on the king's regulars. Some of the colonists grew angry and left.

His army at last came close to Fort Duquesne. He was met, July 9, 1755, by a party of Canadians and Indians under Captain Beaujeu. The British fought bravely, but they could not see anybody to shoot at, for the Canadians and the Indians fought from behind trees, while the

WASHINGTON'S TRIP AND BRADDOCK'S DEATH



When the French began to build forts on the Ohio River, a young surveyor named Washington was sent by the governor of Virginia to order them away. With a few companions he reached the forts.



General Braddock, who led an army into the wilderness to attack the French, did not understand how to fight the Indians, who fought from behind trees and would not come out to be shot at. Only the Virginia troops, who were used to such fighting and adopted the same plan, prevented all from being killed. General Braddock died from his wounds, regretting he had not been wise enough to take advice.

British stood in the narrow road. It is not true that Braddock was surprised, for he knew that he was coming to a dangerous place, but he did not know how to meet the enemy and he was too obstinate and too stupid to learn. The bright red coats of his army made good marks. Braddock himself was everywhere, encouraging or scolding his men, but it was of no use. The Virginians fought from behind trees and logs and kept the enemy from killing every one, but Braddock would not allow his soldiers to protect themselves at all. They stood just as if on parade, but they could do little damage to the enemy. At last Braddock received a wound from which he died in a few hours, and George Washington led away what was left of the little army. Out of about 1,500 men nearly 1,000 were killed or wounded.

THE FOUNDATION FOR THE STORY OF EVANGELINE

This same year the French inhabitants of Acadia were sent away from their homes. The poet Longfellow, in "Evangeline," has told the story, but all that he tells is not quite true. All of the Acadians were not so good as he says, and the English were not so cruel. The Acadians did not like to have their country belong to England, and many of them plotted with the French and the Indians. The English found that they could not keep Acadia unless something was done, and decided to send the Acadians to the different English colonies where they could not do so much harm. Most of the families were kept together but some were separated in the rush and the hurry, and it is of one of these cases that the poet writes.

THE FRENCH AND INDIAN WAR BEGINS AT LAST

All these battles had been fought while England and France were supposed to be at peace, but in 1756 war was declared and began in earnest. It was called the Seven Years' War in Europe but in America was called the French and Indian War. Battles were fought not only in Europe but in Asia, and in America. The French sent a good general to Canada, the Marquis de Montcalm, who soon began to win victories for France, but he could not control his Indians. When they helped to capture a fort or an army, they thought they had the right to kill all they captured. When Fort William

Henry on Lake George was taken, Montcalm promised that the English force should go home unharmed, and the Indian chiefs agreed, but after they started the Indians killed all the wounded and kept making attacks on the column until they had killed six or seven hundred. At another time, Israel Putnam, whom we shall meet again in the Revolution, was captured, fastened to a stake, and the flames were already curling about him, when he was set free by a French officer who was not afraid of the Indians.

THE FRENCH ARE SUCCESSFUL AT FIRST

We cannot tell of all the battles and massacres which took place in the next few years. In nearly all of them the French won and many English and many Americans were killed and scalped. But Montcalm was not supported as he should have been by his government, and the tide began to turn. William Pitt was now in charge of the war in England, and he was determined to drive the French from North America. He was not willing, as other English statesmen had been, to take a little bit of territory here and another there, but he intended to take it all. So many soldiers were sent out that the American colonists were encouraged to raise both money and men for the war.

In 1758, Louisbourg, on Cape Breton Island, was again taken, though the French thought it too strong to fall. In this capture, we see for the first time in America, the soldier who was finally to end the war, General James Wolfe. Though Sir Jeffrey Amherst and Admiral Boscawen were in chief command, the credit of taking this fort must go to Wolfe, for it was he who forced the French to abandon the Grand Battery and finally to surrender. With the surrender of Louisbourg, the St. Lawrence was open for the entrance of the English fleet, and all eyes next turned to Quebec, as the prize for which the English must fight the next summer.

THE INDIANS BEGIN TO DESPISE THE ENGLISH

Victories were necessary if the English were to remain in the country. The Iroquois hated the French, as you have been told before, but they were beginning to despise the English who could not overcome the enemy of both. If the French continued to win victories, soon the Six Nations would refuse to help the

English longer, for the Indians never liked to be on the losing side, and the help of the Six Nations was valuable in many ways. They had seen the English and Americans lose Fort Oswego and Fort William Henry, and fail to capture Ticonderoga. Indians came to visit Montcalm, saying that they wished to see the man who trampled the English under his feet.

THE TIDE TURNS AND THE ENGLISH WIN VICTORIES

After Louisbourg the tide turned, and English victories came rapidly. Fort Frontenac, built of stone by La Salle, where Lake Ontario flows into the St. Lawrence, was taken and battered down by its own cannon. An immense stock of war material was taken across the lake or destroyed. The Six Nations decided that perhaps the English might win after all, and they became sure of it a few months later when Fort Duquesne also fell into English and American hands. The little settlement around the fort was named Pittsburgh and the next year Fort Pitt was built. From that small beginning the great city of to-day has grown.

THE GENERAL WHO TOOK QUEBEC AT THE COST OF HIS LIFE

With the beginning of fighting in 1759, more important English successes came. Fort Niagara, at the mouth of Niagara River, fell, and shortly afterward Fort Ticonderoga was given up by the French. As rats desert a sinking ship, the Indians grew less willing to help the French, while on the other hand the Six Nations forgot that they had even thought of ceasing to aid the English. You remember that the Five Nations became the Six Nations, when they were joined by the Tuscaroras.

Quebec, however, still remained in French hands. Built high on a cliff, over two hundred feet above the St. Lawrence River at the point where the St. Charles River empties its waters into the greater river, the French boasted that it could not be taken. General Wolfe had gone back to England to try to recover his health. There he found that the government was depending upon him to take the fortress. Though far from well he returned to America. He came up the river in June, 1759, and during the whole month of July, sat before the city trying to find a way to take it. Sickness seized his body in August, but his mind was

always on his task. He felt that he could not live long and begged the doctor to "patch him up enough for this business."

Attack in front was impossible, and below the city there was no hope of success. Wolfe then rowed up the river, and his keen eyes finally spied a path along the side of the cliff, used perhaps by goats, or by reckless young men who wished to get quickly down to the water's edge. Few thought of climbing up the cliff. Moving his ships up and down the river without any reason that could be seen, he puzzled General Montcalm who could not imagine what the British were trying to do. On the night of the 12th of September, a part of his men pretended to make a landing below the city, and Montcalm himself spent the night on horseback.

All seemed quiet further up the river above the city, but at midnight 1,600 men in small boats stole down the stream in the shadow of the cliffs. Wolfe in his boat was repeating verses from Gray's "Elegy in a Country Churchyard," and said to one of his friends, "I would rather be the author of that poem than take Quebec."

THE FRENCH ARE SURPRISED AND BEATEN

Quietly the soldiers landed and began the steep climb up the cliff, which they gained before the sentinels knew of their presence. Before six o'clock, the 1,600 were drawn up on the broad field at the top of the cliffs, called the Plains of Abraham. Three thousand more soon followed. Montcalm marched out of the city to meet the English as soon as he could, and a fierce battle followed.

On this broad plain the English had the advantage just as the French had it in the woods at Fort Duquesne. Wolfe's soldiers were English regulars, who were used to fighting in open spaces where they could see their comrades and hear the orders of their officers. A large part of Montcalm's force was made up of Canadians, who were splendid fighters in the woods, where they used Indian methods, but did not do so well in the open ground.

Wolfe was wounded in the wrist but tied a handkerchief around his arm and kept on. A ball struck his leg, but still he did not stop. A third bullet passed through his lungs. He fell, and was carried to the rear, as you can see in one

of our pictures. As he lay there apparently dead, he heard an officer say, "See how they run!" The dying man tried to raise himself, saying, "Who run?" When told that the French were giving way everywhere, he sank back whispering, "God be praised, I die in peace."

THE BRAVE FRENCH COMMANDER DIES DEFEATED

The brave French commander met the same fate. He was struck in the chest, but at first seemed not to feel the wound, until all at once he fell from his horse. When told that he was dying his answer was, "So much the better. I shall not live to see Quebec surrendered." He lingered a few hours, but died the night of the battle. A few days later the city opened its gates to the English. Now upon the Plains of Abraham stands a tall monument erected in honor of two brave men who died, one at the moment of victory and the other in the bitterness of defeat.

The next year an unsuccessful attempt to retake Quebec was made. Soon Montreal also fell into the hands of the English. The colony of New France was conquered, and English officers ruled. The war continued in Europe, however, and in 1762, Spain joined in to help France. The English fleet was too strong for the allies, and Cuba and the Philippine Islands were taken from Spain. Peace was made the next year (February 10, 1763) and the map of North America was made over by the famous Treaty of Paris.

THE NEW MAP OF NORTH AMERICA AFTER 1763

England took all New France and all the eastern half of the Mississippi Valley from France, but gave back Cuba and the Philippines to Spain. In return for these islands, however, she took the Floridas from Spain. East Florida was almost the same then as the present state, and West Florida was a strip of land along the Gulf of Mexico and reaching to the Mississippi River. Since Spain had lost some of her valuable possessions because she had come to the aid of France, that country gave to her the city of New Orleans on the east bank of the Mississippi, and all the territory claimed by France west of that river extending to the Rocky Mountains on the west, and to the head of the Missouri River on the north. We shall meet with

this territory again under the name of Louisiana, though what we now know as Louisiana is only a small part of the territory of Louisiana.

This left France without a mile of territory on the mainland of North America. Only two powers remained. England controlled the eastern half of the present United States, and eastern Canada, and claimed a great unexplored territory west of Hudson's Bay. Spain controlled Central America, Mexico and most of what is now the United States west of the Mississippi River, as well as the mouth of that stream.

Two tiny islands, or groups of islands, St. Pierre and Miquelon, off the coast of Newfoundland, were left to France. They are barren and rocky, and have little value except to serve as harbors for the fishing fleet from France. They remain French possessions to this day. Some of the French islands in the West Indies, which had been captured by the British during the war, were, however, returned by the treaty. France still governs some of the West Indies.

ENGLAND'S VICTORY BRINGS TROUBLES WITH IT

The struggle for the continent was over in Europe for the present, and the great question for England to settle was what to do with her possessions. The war had cost many men and much money, and the Indians were not friendly. Soon the Indians who had been friendly to the French rose to make a last effort to drive the English from what had been French territory. Under the chieftain Pontiac they fought desperately and inflicted much damage. The English fought stubbornly and at last the "Conspiracy of Pontiac" was broken.

It seemed that it would be necessary to keep an army in America to watch the Indians. The colonies had cost much more than had been received from them, and they seemed likely to be a cause of expense for many years. Could they be made to pay a part of the cost of protecting themselves from the Indians?

The British government thought it just that the colonies should pay something, and Parliament soon began to levy taxes without asking the consent of the colonists. The result will be told in our next chapter of the HISTORY OF THE UNITED STATES, which will tell of the Revolution.

THE NEXT STORY OF THE UNITED STATES IS ON PAGE 959.

The Story of FAMOUS BOOKS.

CERVANTES AND HIS BOOK

IN the early years of the seventeenth century stories of the impossible deeds performed by wandering knights were almost the only books read in Spain, where lived the great author whom we call Cervantes. Cervantes decided to ridicule these absurd stories out of fashion; and so he wrote "The Adventures of Don Quixote." The hero of this book is a kindly old gentleman whose head has been turned by reading trashy stories of knights and ladies fair, and this story of his adventures is one of the greatest works in literature, for its abounding humor, its wisdom, and its true humanity, as well as for its pictures of the life of Spain 300 years ago. All the stupid stories of knights and enchanters which were being read when Cervantes wrote his book have been forgotten for ages, but "Don Quixote," first published in 1605, still remains one of the favorite books in the world's library.

ADVENTURES OF DON QUIXOTE

IN a certain village of La Mancha, a territory which is partly in Arragon and partly in Castile, two old kingdoms of Spain, there lived an elderly gentleman whose ways of thought were more exalted than his means. His household consisted of a housekeeper, a niece, and a man-of-all-work. Three-quarters of his income went on food, which was of the most humble kind. The rest was laid out on a plush coat, velvet breeches, with slippers of the same material, for holidays, and a suit of homespun for everyday use.

He was about fifty years old, of a hale and strong complexion, lean-bodied and thin-faced, an early riser, and a lover of hunting. He passed the greater part of his time in reading books about the doughty deeds performed by knights in the brave days of old. So absorbed did he become in these tales that he sold much of the land he owned in order that he might be able to buy the books.

He was so much loved and respected by those who knew him that not only his niece and his servants became alarmed at his odd behavior, but his neighbors also were concerned for his welfare. For while the older books that he pored over were of value, he bought many that were quite worthless, and grew so fascinated with them all that he was unable to tell the good from the bad.

At last he was convinced that the

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only course left open to him was to become a knight-errant himself, to arm himself in the old-fashioned way, and to go out into the world in search of adventure, and, by redressing all manner of wrongs and grievances, to win honor and renown. Full of this idea, he secured a suit of armor that had belonged to his great-grandfather, and had for many years lain by and rusted in a corner of his house. When he had cleaned and repaired it as well as he could, he found that there was no vizor to the helmet. So he made one of pasteboard. Then, being anxious to see if it was cutlass-proof, he drew his sword and tried its edge upon the pasteboard. At the very first stroke he undid in a moment what he had taken a whole week to complete.

Undaunted, however, by this disaster, he made another vizor, fencing this one with some thin plates of iron on the inside. Satisfied with his handiwork, he next thought of his horse.

In his stable was a sorry-looking animal, which, however, he was convinced would compare favorably with any of the famous steeds of which he had read. For four days he was at a loss for a name that would suit such a splendid creature. He decided to call him Rozinante, meaning thereby a horse that, from being an ordinary animal, had become "second to none."

Having decided that he himself

would thenceforth be known as Don Quixote de la Mancha, in order to immortalize his native place, he thought that there was nothing wanting now but a lady upon whom he might in the ancient manner, bestow the empire of his heart "Should I," said he to himself, "chance to encounter some giant, and happen to lay him prostrate on the ground, transfixed with my lance, or cleft in two, or, in short, overcome him and have him at my mercy, would it not be proper to have some lady to whom I might send him as a trophy of my valor?" Now, it chanced that there

lived not far away a good looking country lass, whose name was Aldonza Lorenzo. He thought she would serve admirably, if she had but a name more like that of a princess or lady of quality so at length he decided to call her Dulcinea, with the

addition of "del Toboso," from the place where she was born. Thus provided with all that was necessary to his present way of thinking, he donned his armor, and one fine July morning mounted Rozinante and sallied forth secretly to meet his first adventure. As he rode

along, he was struck suddenly with the thought that he had never been "dubbed" or created a knight. Moreover, he remembered that until he had been dubbed a knight he could neither meet another knight in single combat nor wear dark armor. These thoughts at



DON QUIXOTE POLISHES HIS ARMOR

first shook his resolution, but he resolved that he would be dubbed a knight by the first he should meet, while he would scour his armor at leisure until it should look whiter than ermine. Thus fortified in his plan he went on his way until evening drew on and he espied an inn

HOW DON QUIXOTE BECAME A KNIGHT

THE ADVENTURE IN THE COURTYARD

BOTH Don Quixote and his steed were sorely in need of rest and refreshment when they came up to the inn, at the door of which stood two young women who were going to Seville with some carriers, all of whom were taking up their lodging for the night.

Now, our traveler no sooner saw the inn than he fancied it to be a castle, fenced with four towers with lofty pinnacles glittering with silver together with a deep moat, drawbridge and all other devices peculiar to such strongholds. He thereupon halted, fully expecting that some dwarf would appear on the battlements and sound his trumpet to give notice of the arrival of a knight.

Just then a swineherd sounded a horn to call his pigs together from the stubble-field. Imagining this to be the expected signal, Don Quixote rode up to the entrance. At his approach the two young women started to run away in

alarm but Don Quixote, lifting up his vizor and disclosing his withered, dusty face, accosted them with comely grace and grave delivery, in this manner:

"Do not fly, ladies, I beseech you, nor fear the least offence. The order of knighthood, which I profess, forbids me to offer injuries to anyone, and least of all to damsels of such high rank as your presence denotes."

As the young women laughed outright at this, Don Quixote, speaking in a tone of grave reproof, observed that modesty and civility were very becoming in the fair sex, whereas laughter without sufficient reason was but foolishness. "But," added he, "I do not presume to say this to offend you. My only wish is to do you service."

This speech only increased the mirth of the young women, and our knight's anger was rising when the innkeeper luckily appeared, and, holding the stirrup

HOW DON QUIXOTE BECAME A KNIGHT

for Don Quixote to dismount, invited the latter to enter the inn and partake of such cheer as it afforded. Don Quixote, observing the humility of the governor of the castle—for such the innkeeper and the inn seemed to him to be—replied, "Señor Castellano, the least thing in the world suffices me; for arms are the only things I value, and combat is my bed of repose."

Having besought the innkeeper to look well to his steed, Don Quixote entered the inn, where, with the help of the two good-natured young women, he divested himself of his armor, with the exception of the helmet. This he had fastened on with ribbons, and as these had become tangled, and he would not allow them to be cut, he had to be fed by the young women and the landlord.

When he had partaken of his frugal meal in this awkward manner, he called his host to the stable, and here, falling down at his feet, declared he would not move until the governor had promised to dub him knight. All that night, he said, it was his intention to watch his armor in the chapel of the castle, so that the ceremony might take place in the morning. The innkeeper, who had a sense of humor, promised to do what was asked of him, but observing that, as the chapel had not yet been rebuilt, his noble guest might watch his armor just as well in the courtyard. The host next asked Don Quixote if he had any

money, and, on being told that he had not, informed him that all knights should carry money and clean shirts. Don Quixote, having said that he would see to this in the future, took his armor into the courtyard, placed it in a dry horse-trough, and began his vigil. While he was so engaged, one of the carriers came out to water his mules. When Don Quixote saw this man approach the trough for the purpose of removing the armor, he cried out:

"O thou, whoever thou art, rash knight, that prepares to lay thy hands on the arms of the most valorous knight-errant that ever wore sword, take heed; do not attempt to profane them with a touch, lest instant death be the reward of thy temerity."

But the carrier paid no heed to this warning, and very promptly lifted the armor and threw it out of his way. On this, Don Quixote, calling upon his lady, Dulcinea, in knightly fashion, knocked over the carrier with a heavy blow from his lance, restored the armor to its place, and marched backward and forward with as little concern as if nothing had happened.

Soon after another carrier came out, and, not noticing the form of his comrade on the ground, also attempted to remove the armor. Don Quixote thereupon hit the man so heavily with his lance that his cry of alarm brought out the landlord and all the people of the inn. Very



THE INNKEEPER, TO GET RID OF HIS AWKWARD GUEST, MAKES DON QUIXOTE A KNIGHT

quickly Don Quixote was defending himself from such a volley of stones that he had to shelter himself under his shield, calling out at the same time that they were false and treacherous villains, and that the lord of the castle was a base and inhospitable knight to suffer a knight-errant to be so abused. He carried himself at the same time with so much spirit as to strike fear into the hearts of his assailants, so that they yielded to the appeal of the landlord and stopped the attack.

But the landlord, anxious to be rid of so troublesome a guest, made apologies for the carriers, and, remarking that two hours' vigil was sufficient, whereas Don Quixote had already been watching his armor for four hours, hinted that the ceremony of dubbing him a knight could now proceed. Don Quixote, believing him, asked him to make an end of the business as soon as possible.

Further observing that the rest of the ceremony might be performed as well in a field as in a chapel or anywhere else, the landlord fetched his account-book, and, calling upon the two young women previously mentioned, also a boy, whom he caused to hold a lighted candle, asked Don Quixote to kneel.

Then pretending to read from his book, the landlord lifted up his hand and gave Don Quixote first a good blow on the neck with his hand, and, secondly, a gentle slap on the back with the flat of his sword. He next ordered one of the women to gird the sword about the knight's waist. Her companion having buckled on his spurs, the knight thanked them all, and, Rozinante being brought forth, he rode away, the landlord being so glad to see him go that he did not ask for the reckoning.

Thus it was that Don Quixote de la Mancha was dubbed a knight.

DON QUIXOTE CHALLENGES THE MERCHANTS

THE ADVENTURE AT THE CROSS ROADS

THE adventures that befell Don Quixote soon after he left the inn were enough to damp the ardor of any ordinary knight-errant.

When he had arrived at a spot where four cross roads met, he saw a party of merchants on their way to Murcia. Perceiving here the prospect of a new adventure, and resolved to imitate as much as possible the knightly prowess of which he had read in his books, he posted himself in the middle of the road and called upon the advancing strangers to halt and declare that there was no other damsel in the world to equal "the Empress of La Mancha, the peerless Dulcinea del Toboso."

After some parley, and dissatisfied with the replies given to his demands, the knight couched his lance, and rode so furiously at one of the merchants that had not Rozinante stumbled and fallen the man would have paid dearly for his raillery. As it was, Don Quixote was so encumbered with the weight of his armor that he could not rise.

At this one of the grooms, indignant at what he regarded as the insult offered to the merchant, his master, took the knight's lance, and, breaking it into pieces, belabored him until he was tired

out. At last the merchants pursued their journey, leaving Don Quixote powerless on the ground. Here he was found by a countryman, who, with no little difficulty, lifted Don Quixote upon his donkey, and, putting the knight's armor on the back of Rozinante, led him home.

While Don Quixote was recovering from his injuries, his friends made a bonfire of all the rubbishy books in his library, hoping, by removing the cause of his craziness, to restore the knight to his former healthy state of mind. But at the end of a fortnight Don Quixote prepared to go forth again.

This time he decided that he would have a squire. To this end he induced an honest but poor country laborer named Sancho Panza to go with him. He promised Sancho Panza that when opportunity offered he would make him the governor of some island, and this prospect so dazzled the fancy of the stolid countryman that he saddled his donkey, Dapple, and, joining the knight, mounted on Rozinante, the two made such haste that one morning by break of day they had traveled so far as to believe themselves out of reach of pursuit, by the friends who wished to stop them.

THE NEXT STORIES OF DON QUIXOTE BEGIN ON PAGE 967.

The Book of OUR OWN LIFE

WHAT THIS STORY TELLS US

WE read in these pages more about the microbes, the wonderful little creatures that live everywhere about us and are working all our lives either for us or against us. We learn here why we could not live without our microbe friends, and why men die through their microbe enemies. We learn, too, of one of the most wonderful things in the world—the way in which these little creatures, so tiny that the eye cannot see them, keep the earth from becoming piled up with dead things, by taking these dead things and preparing them for new life. We learn that the nearer we live to Nature the less harmful are the microbes to us, and we learn, too, one of the most serious things in the world—that if men would only work together in earnest to fight the microbe of tuberculosis, as men once worked together to destroy the wolves, tuberculosis would be quite stamped out of the earth.

OUR UNSEEN FRIENDS AND FOES

DIFFERENT kinds of microbes have different powers. Some will break down one kind of plant, some another. There are kinds of microbes in the earth which have special powers of making food material with the aid of the air which is found in the earth. Air contains a very valuable element, called nitrogen, but unfortunately most living things cannot use it. Nitrogen, in a way, is the most important element needed to make living matter. We breathe it, it is taken into our blood, but we cannot use it in its pure form. But certain microbes can take this nitrogen and combine it with other elements so as to make compounds, which are perfect food materials.

Recently these special microbes have been purposely cultivated in the places where men of science work, and can be put in bottles and sent by post, and then sown, so to speak, in a field, so that, when the farmer comes afterwards to sow his wheat, these microbes will be ready to provide the young wheat with the best food.

These particular microbes are specially fond of certain kinds of plants belonging to the tribe of peas which are not only useful in themselves; but besides the farmer knows that it is worth his while to grow these plants one year, so as to make the soil rich in food for his wheat in the

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next year. If he grows wheat every year the soil will become exhausted of

its food materials, and so farmers have long practised what is called the rotation of crops. It is, of course, a very serious matter, for

the farmer and for the country, that the farmer cannot grow wheat every year. But now I think our discovery of microbes, and of what they do, is going to prove of the greatest value before long in actually making bread cheaper. It is hoped that, by using these special microbes we may soon be able to grow wheat, year after year, in the same soil.

The dairyman should really be no less interested in microbes than the farmer should be, for they are of the utmost importance in all his work. Amongst them are included his best friends and his most dangerous enemies. If we realize that microbes are everywhere, we shall understand that they invade milk from the very moment that it is drawn—microbes of all kinds, useful and dangerous, from the air, from dust and from water. Now milk is one of the best things in the world in which to grow microbes, and so those which get into it grow very quickly, for good or for evil. It is the duty of the dairyman to keep out of his milk, as long as it is in his charge, all dangerous microbes.

It is the duty of everyone who is in charge of milk to know that this, which is a perfect food for us, is also a

perfect food for some of our most terrible enemies, such as the microbe that causes tuberculosis, and the microbe which kills tens of thousands of little babies every summer. It is only within the last few years that we have learned, in America, to take care of our milk, and in this we have followed the example of little Denmark.

THE MICROBES THAT GIVE US MEDICINE WHEN WE ARE ILL

But here we are talking especially about the natural and proper work of microbes. Now, there are quite a number of them which are, in a sense, natural in milk, and are indeed known as milk microbes. I do not say that they are found in milk when it is drawn, but they are certain to enter it, and they are indeed very useful in it.

These microbes exist in enormous numbers in cow-barns, and they always get into milk very soon after it is drawn. Now, the extraordinary thing about this is that as they grow and multiply in the milk they prevent other microbes, which might be bad for us, from growing there. In course of time they turn the milk sour, but sour milk is not bad for us, and, indeed, the microbes in sour milk, when they enter our bodies, help to protect us from other microbes which might do us harm. So they are really very good friends of ours, and nowadays, when people suffer from certain kinds of illness, they are purposely given sour milk in order to make them better. The microbes in sour milk help us to digest our food, and they prevent other microbes, which would hurt us, from multiplying in our food after we have swallowed it.

THE MICROBES THAT HELP US TO MAKE BUTTER AND CHEESE

But there is more to say than this. From milk we get cream, and from cream butter, but without the proper microbes of milk butter could not be made at all. It is the milk microbes which cause the cream to ripen, as it is called, so that butter can be made from it. That is one of the reasons why I said that some microbes were good friends of the dairyman.

The different flavor of different kinds of butter depends on the particular kind of microbe that ripened the cream from which the butter was made, and nowadays we can cultivate, quite easily, just

those kinds of microbes which help us to make butter that has the kind of flavor which people like. As the microbes start the process of butter-making, they are called "starters," and in many parts of the world, though not yet in America, men of science supply the best kind of "starters" to farmers with which to ripen their cream.

Just as we could not have butter without microbes, so we could not have cheese. All cheese, of course, is really made from milk, and the milk produced by any particular kind of animal, such as the cow, is the same all the world over. Yet there are dozens of different kinds of cheese, and their differences mostly depend upon the particular kind of microbe which has been used—whether people know it or not—in making the cheese. These, too, are now cultivated, and by sending tubes or bottles of them anywhere, you can enable the people there to make the particular kind of cheese usually made far away from them.

Besides butter and cheese, there are various special preparations of milk made in some parts of the world, some of which are very valuable when people are ill, since the body, even when ill, can use them easily as food. All these special preparations of milk owe their existence to microbes.

WE OWE OUR BOOTS AND SHOES TO OUR MICROBE FRIENDS

We owe our boots to microbes, too. Boots, you know, are made of leather, and all leather is made from the skins of animals by a process called tanning. But tanning would be impossible without microbes; so that we owe our boots to them as well as cheese and wine and cigars. Then they are used in preparing the dye called indigo, and in preparing many kinds of food for cattle, and we even owe some kinds of clothing to microbes, for without them it would hardly be possible to spin linen out of flax. Nor is this all.

Every great city has to deal with the problem how to dispose of its waste matter. The old way was—if the city were on a river—simply to pour the sewage into the river and let it poison the people of cities further down who drank the water of the river. I am afraid that a great deal of that goes on still, but it is dirty and nasty and selfish, and it destroys much human life.

We are slowly learning now, however, that there are ways of dealing with sewage which make it more or less harmless, and one of these ways is by using microbes. Now, it is the bad microbes in the sewage which make it so dangerous, and so the use of other microbes, to make the sewage harmless, or to get rid of it, is rather like the old principle expressed in the proverb, "Set a thief to catch a thief."

We see now that these tiniest of all living creatures play a great part in the world. But after all that has been said about wheat and butter and cheese and boots and linen, and so on, we must understand that all these useful things which microbes do are really quite unimportant compared with the first thing we talked about—the marvelous way in which they clear the earth of the bodies of all dead creatures, animal, vegetable, and even human, so as to make room for those who are now living and those who yet shall be; and, more than that, turn the stuff of which these millions of dead bodies are made into fresh, wholesome, and pure food material to nourish the life of the earth.

THROUGH THE WORK OF THE MICROBE THE LIFE OF THE PAST MAY LIVE AGAIN

You know what economy means? Literally, it means the "law of the house," by which everything is done in order, everything has its use, everything is put to the best purpose, and nothing is wasted. The work of microbes is the greatest instance I know of the economy of Nature—the law of her house. There are many lives which seem useless—the humble life in the sea, for instance, and thousands of kinds of humble life in the earth under our feet. But even though all these lives seem to come to nothing in themselves, yet their work is never wasted. There is no wholly wasted life in the world, for there are always microbes ready to take the dead creature's body and prepare it, so as to be useful for future life, which may be better and higher life.

Our own lives—even the lives of the greatest men and women—are built upon these humble foundations, and so, in a sense, we may say that through the work of microbes even the humblest living creatures of the past live again in us. So in this wonderful way life

goes on climbing, and perhaps even we, who think so well of ourselves, will some day be looked upon as only the stepping-stones to something higher still; and if microbes can help to that end, so can we.

THE MICROBES THAT HAVE BECOME A TROUBLE AND PLAGUE TO MANKIND

Now, we must be quite fair, of course, in talking about microbes. Most people are very unfair, because they know nothing about all the useful and necessary work which microbes do, and talk about nothing but the harm which they do. But if that is unfair, so also would it be unfair if we should talk only about the good they do, and say nothing about the other side of the picture, for, unfortunately, there is another side.

All, or nearly all, the useful microbes we have been talking about live on dead matter; but, as we saw, there are a certain number of microbes which live, not on dead matter, but in and upon the bodies of creatures which are still alive. Probably all microbes began by living upon dead matter, but some of them learnt how to attack the bodies of very old or nearly dying plants, or animals, and so at last there were produced the present race of microbes, which invade the living bodies of higher creatures, and are a terrible scourge to mankind.

Plants and animals and men may all suffer in this respect; but it is very interesting for us to learn that, when creatures live wild, as we say, in their natural state, in the open air of heaven, and in the light, they suffer little from microbes.

PLANTS AND ANIMALS GROWING WILD ARE FREE FROM THE MICROBE PLAGUE

Wild animals and wild plants scarcely suffer at all. But when man takes various kinds of plants for his own purposes, and grows them in conditions which are not really natural, they are often attacked by microbes; and it is the same with animals. Oxen and cows suffer from tuberculosis, for instance, but that is not when they are in their natural state, but when men take them and shut them up in badly ventilated and badly lit places. We must learn to stop this, for the cows can give tuberculosis to us by passing on microbes in their milk.

Just the same is the case with the monkeys and many other animals that

are kept in the Zoo. In their natural state, these creatures are not attacked by microbes; but if we take monkeys, which ought to be living in the open air amongst the trees, and shut them up in covered cages, then the microbes of tuberculosis attack them, and they die.

A LESSON FOR OURSELVES THAT WE LEARN FROM THE MONKEYS

You would think that if you took a wild animal, such as a monkey, which naturally lives in a hot part of the world, and brought it to America, the most important thing to do would be to keep it warm. However, quite lately they have learnt at the zoos that the warmth does not matter very much, but that if they are kept in the fresh air, even though it is colder than they are accustomed to, the microbes of tuberculosis will not attack them.

This is a lesson for us, and we are just beginning to learn it. If monkeys and tigers, and so on, were really meant to live in fresh air, with the sky as the roof over their heads, so also were men and women; and if we shut ourselves up, as we shut up cows and monkeys and tigers, microbes attack us, just as they attack them. The kinds of microbes which are useful to us, such as those which keep the earth sweet, those that help plants to grow, and so on, can thrive in the open air, and the light of day helps their work; but the dangerous microbes, and especially the microbe of tuberculosis—which kills far more human beings every day than all the snakes and tigers in the world kill in a year—are themselves killed by open air and sunlight.

There are houses in America with rooms for people to live in where the windows are made so that they cannot open. There are thousands of rooms in many cities of the world which have no windows at all, and have to be lit artificially all the day. No human being should live in such a room; microbes are almost certain to catch him and kill him. It should be a crime to make such rooms.

ONE OF THE MOST TERRIBLE EVILS IN THE WORLD WHICH WE COULD STOP

The great truth is that in this case, as in so many others, men and women bring most of their evils upon themselves. We talk about microbes as if they were our deadly enemies, and had

somehow come into the world just in order to hurt us. This is absolute nonsense. We could not live without them, and by far the greater number of them are unable to do us any injury. Those which hurt us most we bring upon ourselves.

I am especially thinking of the deadliest of them all—the microbe of tuberculosis, a disease from which many American men and women have died since you began reading this part of our story. It is one of the most terrible evils in the world, but it is not necessary, and we could absolutely put an end to it in a few years if we all made up our minds that this was worth while. If we lived natural lives, and if we allowed those of our fellows who are less fortunate than we are to live natural lives, the microbes of tuberculosis would not hurt us any more than they hurt other creatures which live natural lives. But we do things that are unnatural. The laws of Nature teach us that we were made to breathe fresh air; we defy those laws, and then we cry out against Nature for her cruelty in sending the microbe of tuberculosis to kill us.

HOW THE MICROBES WARN US TO TAKE CARE OF OURSELVES

By far the greater number of all human diseases are caused by the attack of microbes, the tiniest, humblest, and very nearly the oldest of all living things. Considering the murder they do every day, no wonder we are afraid of them; no wonder most of us think they are all evil. But the astonishing thing is that, whilst human beings almost always die of some disease—which is nearly always caused by microbes—yet animals do not die of disease except in comparatively rare cases. On the whole, we may say that microbes do not attack them, but only attack us. So soon, however, as we put animals or plants into conditions that are not natural, as we foolishly put ourselves, then they suffer just as we do and for the same reason.

Before very long we shall learn from this striking lesson that we cannot do without air and sunlight; that we must not be packed too closely together; and that, if we obey these laws of our own lives, then the lives of other living creatures, such as microbes, will scarcely injure us. If we can save the monkeys in the cages from the microbes of tuber-

culosis by keeping them in fresh air, we can also save each other in exactly the same way.

One of the most important of these microbes is not usually called a microbe, but it might quite well be so called, for it is a close relative of microbes and lives in the same way. There is no reason why it should be an enemy.

THE MICROBE THAT HELPS TO DRIVE THE MOTOR-CARS

This is the yeast plant, which turns sugar into alcohol and the gas called carbonic acid. We use it every day in making bread. The alcohol is blown away as a gas and the carbonic acid forms in the flour and makes the bread rise.

But we also use the yeast plant to get the alcohol that it makes. This also is a very useful substance; it is used in hundreds of arts and industries; it is splendid for cleaning things and for preserving them; it burns beautifully and makes a splendid fuel; it is, perhaps, the cheapest and most easily made of all fuels for many purposes. It is cheaper than gasoline, which is now used for motor-cars, and some people expect that before long alcohol will be used to drive motor-cars, and also to work engines. So, if we had the sense to know how to use alcohol in useful ways, the tiny yeast plant which produces it would be among the best friends of man.

But, as you know, men drink alcohol. Now, this substance is a poison to all living creatures, without exception, men or animals or plants. It is even a poison to the yeast plant that makes it, and when the amount of alcohol in the sugar, which the yeast plant is feeding upon and changing, reaches a not very high proportion, the yeast plant is killed. So, if the process is wanted to go on, the alcohol has to be taken away as it is made.

HOW ALCOHOL MAKES THE BED OF DISEASE IN EVERY LIVING THING

Alcohol is of no use to our bodies, but in time will cause disease in every part of them, especially the brain, which is the most important part of us. It also prevents us from protecting ourselves against other microbes, and this it does in some very interesting ways, which we shall see later. Most especially is it

the great friend and ally of our great enemy, the microbe of tuberculosis, for which it prepares the way by making our bodies unable to resist it.

You can usually find the microbe of tuberculosis in abundance in liquor-saloons, because many people who suffer from tuberculosis spend much of their time in such places, and there the microbe attacks new people who are made ready for it by alcohol. Especially does this apply to children, and there are far too many little children in America whose playground now is on a dirty floor, covered with microbes. But men are fighting to stop this, and are going to stop it soon.

Now, a word or two about the microbe of tuberculosis. It was found late in the last century by a great German called Koch, who is still alive, and who took up the work of the Frenchman, Pasteur—the first man to understand and tell us about microbes. We know that many thousands of people are killed by the microbe of tuberculosis in America every year. All over the world, wherever men are crowded together, this microbe destroys them; but now that we have found it out we are trying to make an end to tuberculosis by attacking its great friend, alcohol, made by the yeast plant, and by teaching people the value of fresh air.

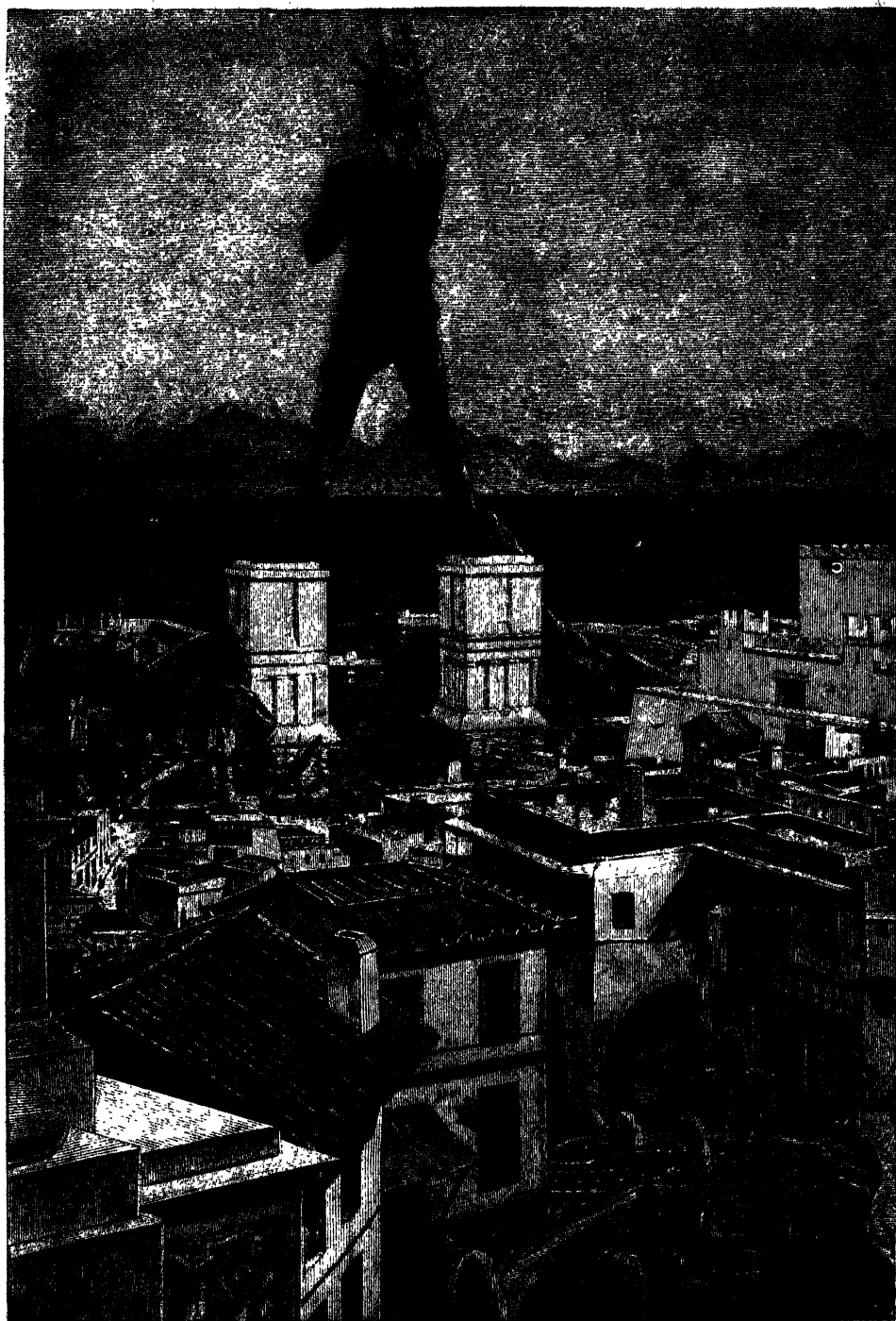
THE MICROBES THAT DO MORE MISCHIEF THAN THE WOLVES

Probably the microbe of tuberculosis is one which can scarcely live at all except in the bodies of other living creatures, such as ourselves, and so, when we prevent it from attacking us, it will no doubt die out altogether. We shall destroy it just as our ancestors destroyed the wolves which used to do much harm—though never a thousandth part of the harm that the microbe of tuberculosis does—but which they made up their minds to destroy.

Of course, there are many other microbes which hurt us, but I cannot say any more about them now, and though I have ended by talking about the bad side of microbes, I want you to understand that that is largely our own fault, and that, though some microbes kill us, yet without microbes as a whole, we could not live at all.

THE NEXT PART OF THIS IS ON PAGE 1019.

ONE OF THE WONDERS OF THE WORLD



This tremendous figure of a man is called the Colossus of Rhodes, and was made 300 years before Jesus was born. There were great statues on the island of Rhodes, but this was the greatest. It was made in honor of the sun, which the people worshipped. One finger of this statue was longer than a man, and it is said that it was mounted on huge towers like these at the entrance to the harbor, and looked out upon the sea for 500 years. Then an earthquake destroyed it.



WHAT MAKES A BEE HUM?

THE humming of the bee and of so many other insects is not like the murmur of the sea-shell, which picks up sound like a telephone, but is made by the bee itself. You have never heard a bee hum when it was crawling—nor any other insect. This tells us what we might have guessed, that the bee's humming is made by the movement of its wings when it flies. The noise is not made by its voice-box, as when you sing, for the bee has not got a voice-box. But its wings move very quickly—a bird would "hum" when flying if its wings moved quickly enough—and as they move to and fro, or *vibrate*, or tremble, they set the air moving, too, and you know already that waves in the air make sound when we hear them.

If the waves are too slow, as when you wave a stick in the air, or when a bird flaps its wings, we hear nothing. If they are too fast, as they are in the case of some insects, perhaps, and in other cases, like the scream of the bat, we cannot hear them; or, to take the bat, some people can hear them, but many, and especially old people, cannot. Thus there are many sounds we cannot hear, as there are many colors we cannot see. But the vibrations in the air made by the bee's wings are of a rate that is within the range of our hearing—if the bee is near enough—and so we

CONTINUED FROM P. 816



hear a humming. I am sure you will guess that that word like "murmur," is made to imitate the sound of which it is the name.

CAN WE HEAR A NOISE LIKE WAVES IN A SEA-SHELL?

I am afraid, said the Wise Man, that the pretty idea in this question is only just a poet's fancy, and nothing more. The truth is, we only imagine a likeness between the sound of the shell and the sound of the sea; though I quite admit that it is easy to imagine, and that we may forgive the poet who said that the shell is "Murmurous still of its nativity"—its place of birth. Murmur is a good word for this, made on purpose to imitate the sound.

Really, then, the shell is one of those things which can pick up and make stronger certain kinds of sounds. The wooden part of a violin does this: if you take it away and play on the strings without it they make a feeble, thin, unpleasant tone. These things that *make sound resound* are called *resonators*. The body of the violin is one, the sounding-board above the pulpit in some churches is another, and a shell is a third.

WHAT ARE THE SOUNDS WHICH THE SHELL PICKS UP?

"The shell," you may say, "makes a murmur even when everything is quite quiet; surely the sound is made within itself—it murmurs still the

sounds of its birthplace." The answer is that really it is never *quite* quiet, and that the shell picks up sounds so slight that we do not hear them at all without the shell. The other day this was shown in a new way. A clever man built a sound-proof room. People inside it heard their own hearts beating, and so on. But there were cut out of the room all the tiny noises that usually go on, and when a shell was held to the ear nothing at all could be heard. The shell is only a telephone, and if no sounds come for it to resound, it is silent. But the beauty of the poet's idea remains; and it is true as a picture of what happens with men and women, and their remembrance of the places and people of their childhood.

DO PEOPLE LIVE ON THE MOON?

Well, we have only seen one side of the moon because, as it goes round the earth, it turns slowly on itself, so as always to keep the same side turned towards us. But we are all quite sure that there are no people on the moon, either on this side of it or on the other side, which we have never seen. People could not live on the moon because the moon has no air and no water. Even if people could live there without air or water, they would probably be burnt to death in the daytime, having no air to protect them from the heat of the sun, and they would be frozen to death at night, having no air to keep in the sun's heat. There are certainly no people on the moon, and never were.

But possibly at one time there may have been humble forms of plant life on the moon, and some people suppose that there may be a little of this even now, for it is just possible that there may be a very tiny amount of air and water still left at the bottom of some of the deepest valleys in the moon. If there were a building on the moon as big as the Capitol at Washington, we should be able to see it through our biggest telescope, but there is not the slightest sign that intelligent beings have ever made a mark of any kind on the moon.

WHAT ARE THE STARS MADE OF?

Not very long ago, a very great thinker declared that this great question you ask me was one which men would never be able to answer, however

long they thought and however hard they worked. Our telescopes could never tell us; the biggest telescope that could ever be made would never tell us.

It would only make the star look nearer and brighter, but would tell us no more what the star is made of than our eyes can tell us without a telescope. But now we have a wonderful instrument by which we can study the kind of light that is given out by any star that we can see. And since we find that the light of the stars, thus studied, is exactly the same as the light given out by things we know on the earth when they are made hot, we now know that *those same things* are found in the stars.

So I can answer your question, and the answer is that the same kind of stuff of which this paper, and your eyes, and my ink and pen are made are to be found in the stars. The stars are made of the very same kinds of stuff as the earth is made of. Of course, all the stars are not the same. Even with our own eyes we can see that some are redder and some whiter than others. Some have much more oxygen in them, and some less, for instance; but the point is that it is oxygen, the very same stuff as we breathe at this moment.

WHY DO THE STARS TWINKLE?

This sounds a very much easier question than the last, but we are not yet quite certain of the answer. Of course, you know that it is stars that twinkle, and not the other wonderful things looking like stars, which are called planets, and which, like the earth, belong to the sun's family.

The planets shine by the light of the sun, which they throw back, or reflect, from themselves, as the moon does, and, like the moon, they shine steadily. But the light of the stars is made by themselves, and comes over immense distances to us, so long that, as we have already seen, the light by which we see the nearest star left it something like four years ago.

It is likely that this light interferes with itself as it comes, so that it seems to come in little beats, and people who have studied this think that it is much the same as what sometimes happens with the piano or an organ when the sound seems to get louder, and then less loud, backwards and for-

wards. In the study of sound this is called a "beat," and it is probable that the twinkling of the stars is really the same kind of thing. It may be that the air has something to do with disturbing the light, and that perhaps starlight is more affected by the air than the sunlight by which we see the moon and the planets.

DID FLOWERS ONCE ALL GROW WILD?

Certainly all the flowers did once grow wild, and all animals, too. There are certain kinds of flowers and animals which men have, so to speak, made by choosing the kind of thing they wanted and leaving the rest, and so gradually getting such things as the garden rose, the pouter pigeon, and so on. These are what we call *cultivated* varieties, but all of them, even the most curious and newest orchid, or pigeon, or breed of dog, have been made from wild or natural forms; and, of course, before man started doing this, all flowers, all plants, all animals, were wild. Even now, if we are careless, our garden plants will return sometimes more or less completely to their natural state, and so will domestic animals. On the other hand, cultivated flowers may escape from a garden, as we say, their seeds being carried by insects or the wind, and may then appear to have grown wild. There is no end to what we might do by cultivating plants and flowers. Men used to try only to make beautiful forms, but lately they have tried to make useful ones, and have succeeded, especially in making from old kinds of wheat new kinds which are far more valuable for human food.

WHY DOES A NOISE BREAK A WINDOW?

The answer to your question is easy if you know what a noise is. It is an irregular wave in the air—which is a real thing, and has weight and power, remember. A wave of air may break a window exactly as the wave in the sea will break a breakwater, though, as the name tells us, the breakwater will break the wave, as long as that wave is not too strong.

If you think a minute, you will see that every time a noise gets through a shut window it shakes the window. If the noise is coming in from the street, the air outside is thrown into waves which pass through it until they strike the window, and shake it; then the

window shakes the air inside the room in exactly the same way as the air outside shook it, only perhaps not quite so strongly. And so the noise reaches you, just as if you had heard it outside, only not quite so loud. Well, plainly, the noise has only to be loud enough—that is to say, the waves in the air have only to be big enough—to shake the window more than it can stand, and then it breaks. Now, I said that air is a real thing which has weight and power, and so the truth is that when you ask me why does a noise break a window you might just as well ask me why does a cricket-ball break a window!

WHY DOES THE KETTLE SING?

Everything that sings, sings really for the same reason—because it is set vibrating. That difficult word simply means trembling. When you sing or speak you make the little cords in your throat tremble, and when a kettle sings we may be sure that something is vibrating somewhere. This sets the air round it vibrating, and if it vibrates quickly enough we can hear it sing. If you only had a stick in your hand, and could turn it quickly enough in the air, you could make the stick sing.

Now, kettles do not always sing quite the same tune, and that depends upon a number of things; but at any rate we can understand that, as the water gets hot and begins to boil, it is turned into water-gas, or water-vapour, and it has to force its way out through the spout, and past the lid of the kettle. As it does this it sets various parts of the kettle trembling, and so the air is made to tremble, and so the drum-head, or window, in your ear is made to tremble, and *somehow* your brain feels this, and you say the kettle is singing.

It is the pressure of the gas coming out that sets the kettle trembling. When you speak or sing you nearly close your throat, and then squeeze the air in your lungs through the small opening; and it is the pressure of the gas that sets your vocal cords trembling. So the kettle sings just as you do.

WHY DOES THE MILK TURN SOUR?

If we could prevent anything from getting into milk from the moment the cow is milked, it would never turn sour, and perhaps it is a pity that we cannot

do this. But what happens is that all sorts of things get into the milk. Some of these are just specks of dirt which we can see, and these we ought always to be able to keep out, but other things which get into milk, falling into it from the air or from the sides of the vessels it is put into, cannot be seen in the ordinary way, for they are so very small.

These are tiny little living things called microbes, and it is because they are alive that they are so important. All kinds of these get into milk, but there is one kind with a special name, meaning the microbe of milk, which is always to be found in milk.

DOES SOUR MILK DO US HARM?

Fortunately, the milk microbe does not much hurt anyone who drinks the milk. It finds milk a very nice food, as we do, and it is specially fond of the sugar which it finds in milk. Out of this sugar it makes an acid, and it is when this has been made in the milk that we call the milk sour. Such milk, if nothing worse has happened in it, is really almost as good as fresh milk, but the trouble is that, when milk has been turned sour in this way, other microbes—some of which are very bad for us—are almost sure to have grown in it, too.

It is quite easy to prove that these special microbes turn the milk sour, for if we add to the milk something which kills them, or—which is very much better—if we heat the milk, and kill them in that way, and if then we keep the milk in a vessel which has been scalded with boiling water, and if we keep the milk from the air, it will not turn sour. Milk should never be exposed to the air, for whenever it is these little microbes will drop into it.

DOES A WORM BREATHE UNDERGROUND?

Every living thing breathes, whether in earth, or on the earth, or in the sky, or in water. If it cannot get air it dies. The worm really has no trouble at all, for there is plenty of air and to spare in the earth anywhere near the surface, and it just helps itself. Of course, if you dig deeply into the earth, there will not be enough air for a thing like a worm, which needs a good deal; and you will find only living creatures, like some microbes, or tiny plants, which need very little air. Further down still you

will find no living things at all. There is no life at all in the inside of the earth.

DO SEEDS BREATHE?

Seeds are no exception to the rule that every living thing must breathe. Nor are eggs. Perhaps you have never thought that an egg is alive? But if you varnish an egg, so that no air can get through the shell, it will die, and no chicken will come out of it. Now, the seed gets its air, or, rather, its oxygen from the air, just as the worm does. So you must not plant the seed too deeply, or it will not get enough air, and then it will die. You may wonder that a seed should breathe, but that is because we always think of breathing as if the only kind of it were our breathing, with ribs and lungs.

The air in the earth, which enables plants to grow from seeds and trees from acorns, and keeps alive worms and insects and many microbes, is known as *ground-air*, and as its warmth depends on the warmth of the earth, it is very different at different times of the year. That is one reason why certain illnesses attack us at certain times of the year—because the warmth of the ground-air is just right for the growth of the microbes that cause those illnesses. Remember, there is air in the earth as there is in water.

HOW DOES A BALLOON KEEP UP?

This question is really the same in its explanation as the question why does a stick float. I want to remind you again that the air is a real thing. If there were no air, the balloon would drop like a stone, just as, if the water all disappeared from the sea, the fishes would drop to the bottom. Things float in the sea, or on the surface of it, because the amount of stuff in the space they occupy is less than the amount of stuff in the same space of water. It is a question of density, which we read about on page 566. The less dense thing always tends to lie above the more dense, and if the things in question are gases or liquids, they always will follow this rule. If you pour hot and cold water into a bath or into a tumbler, the hot water will lie at the top and the cold at the bottom, because water is less dense, and therefore less heavy, when it is hot than when it is cold. Gases behave in exactly the same way.

A ROADWAY CUT THROUGH A TREE



There are trees that live to be many hundreds of years old ; there are trees so huge that a carriage and four horses can drive through them. This is one of them. It is one of the largest trees on the face of the earth, standing in Mariposa Grove, California. It is called the Wawona Tree, and is so enormous that, as we can see from this picture, a road has been cut through the middle of it, and a horse and wagon can pass through it with plenty of room to spare. The tree is twenty-eight feet across and very high.

Hot air behaves in the midst of cold air just as hot water behaves with cold water—it goes upwards.

Now, if you put the hot air into something very light, the hot air, as it goes upwards, will take that something with it. The first balloons were made in this way. Two Frenchmen, brothers, made balloons of silk and linen and filled them with hot air and smoke, and after making balloons which carried animals, they persuaded some men to be carried in this way. You understand that this was simply because hot air is less dense than cold air, and therefore lighter.

WHAT MAKES THE BALLOON GO?

But, of course, hot air gets cold, and then your balloon will come down. So we ought to fill our balloon, if possible, with some gas or other which, even when it gets as cold as the air around it, is still lighter than the air. Nowadays balloons are filled with such a gas. Its name is hydrogen, and it is extremely light; indeed, it is quite the lightest thing we know. Oxygen, for instance, is sixteen times as heavy, and nitrogen fourteen times as heavy, and as the air is a mixture of these, hydrogen, if let loose in the air, will fly upwards at once, and, if you have enough of it, it will carry not only a covering to keep it together, but also many people in a car hung from the covering. In another part of this book we read about the gas called hydrogen. The interesting thing for us now is simply that it is so very light, and therefore is more useful than anything else for filling balloons with.

WHERE DOES THE SNAIL FIND ITS SHELL?

The answer to this is that the snail makes its shell from its own skin. The same is true of the shell of the oyster, or that of the lobster. Our own skins, we know, can make things which are fairly hard, such as our nails; and it is also true that the hardest things in our bodies, our teeth, which are, or should be, even harder than the shell of the snail, are really made from our skin, which has been, so to speak, turned into our mouths so as to line them. There are really few things more wonderful than the way in which quite soft, living creatures, mostly made of water, are able to make the hardest things, like

teeth and wood and shells and pearl, and so on. If we look very carefully at the skin of creatures like the snail, we can see how its outside cells are specially made so that they can gradually get harder and harder, until they cannot be called skin at all, but are really nothing else than shell. We can watch very much the same thing if we look at the cells at the base of our nails or the cells that make the horns of animals, and see how the soft skin is gradually changed.

HOW DO FLIES WALK ON THE CEILING?

Well, said the Wise Man, you might have said why can flies walk upside down, which sounds more wonderful still. The reason, no doubt, is that the fly's feet, besides being just the least little bit sticky, are made like suckers, and hold on to whatever the fly walks upon, just as a boy's sucker will hold on to a stone, so that he can lift the stone by means of it. Then, of course, we have to remember that the fly's body itself is very lightly made, just as a bird's body is, because both are meant to fly; and this makes it easier for a very little force to prevent the fly from falling even when it is upside down.

WHY DO NOT SPIDERS GET CAUGHT IN THEIR OWN WEBS?

It is the strength of the spider that prevents him from getting caught in his web, which is only made for catching creatures much weaker than himself. We know for certain that the spider can cut his web when he pleases, so that there is no fear of his getting caught in it. The spider is a wonderfully clever animal, but he is not brave. If an insect that is too big for his taste comes against his web, he will sit quite still in one corner and never move until it goes away, and sometimes he is so frightened that he simply cuts his web rather than get into difficulties with something that is more likely to eat him than the other way about. In this he is cleverer than some men, who make nets to catch other people and get caught in them themselves. In proportion to his size, the spider is a very strong animal, and it is really wonderful that he can cut his own web, for they say that in proportion to its weight it is the strongest thing known—stronger than steel.

HOW DO BIRDS KNOW HOW TO BUILD THEIR NESTS?

If you had asked me instead how do spiders know how to make their webs, the answer would have been just the same as the answer to this question; and, though we can tell you something about it, yet no one has really explained how it is that animals are able to do these wonderful things. It is by the power of what we call instinct. We human beings have very little instinct; we have to learn for ourselves almost everything that we do. We cannot write or read instinctively, and if we are to learn well we must practise, and we must have help from older people to teach us. Only we have this advantage, that there is *no limit* to what we can learn.

The instinct of animals, however, shown in the spider's web or the bird's nest, or a thousand other things, is quite different. There is no learning at all. Many animals have to do a most difficult thing only once in their whole lives, and after doing it they die; and we know for certain that they have never seen any other animal do it. They have never learnt, they have never practised, and yet they do it perfectly. That is the power of instinct; but the weakness of it is that it can only do what it is made to do, and it is for this reason that intelligence is so vastly superior to the best instinct. You will say that I have told you a lot about instinct, but nothing about where it comes from; and that is quite true, because no one knows.

WHY CANNOT FISHES LIVE ON LAND?

The answer to this is curious. Every living thing must have air or die. The fish comes out of the water, where there is very little air, into the air itself, and there it dies for lack of air. It is drowned on land for lack of air, and dies of what is called suffocation, just as you or I would be drowned in the water.

But why on earth—in this case you may be excused for saying “on earth”—cannot the fish help itself to the air around it when it is put on earth? Why should it starve in the midst of plenty, like a rich man who has something the matter inside him? The reason is, that in order to breathe air you must have lungs, or something like lungs, and the fish has none; whilst in order to get the air which is dis-

solved in water, which the fish does, you must have something quite different from lungs, which are called gills. The fish has no lungs, but only gills. We have no gills, but only lungs. Therefore, we die in the water and the fish dies out of it. If an animal had both gills and lungs, then it would be able to get air from the air or to get the air which is in water, as it pleased; and it could live both on the land and in the sea.

HOW IS A STONE MADE?

Stones are really pieces of broken rock. Quantities of rock are broken into sharp stones by a crushing machine or hammer, for use in ways such as building roads or streets.

But rocks are broken up in many other ways. Even the life in the soil on a cliff, for instance, may gradually break up the surface of the rock. If the pieces rub against each other, and are open to the wind and the rain, then they get rounded and dull; but if you take many of these stones and break them, you will find the unchanged rock inside them, often beautifully smooth and bright. There are other kinds of stones which are quite soft. Those we have been speaking of are made of real rock which long ages ago was made under the action of great heat. But you may pick up sometimes a soft stone which you can quite easily rub away—a piece of soft sandstone, which is really very much the same as the sand on the seashore; and indeed, when it is rubbed down, what it makes is very much the same as sand.

WHY DOES COAL BURN AND NOT A STONE?

The simple answer to this is that stone is burnt already and cannot be burnt twice; but, of course, that answer wants explaining. What happens when a thing burns is that it combines with the oxygen of the air. When it has taken up all the oxygen that it possibly can and has combined with it, then it is completely burnt, and can burn no more.

We watch a candle, let us say, burning, and we are deceived because we do not see the result of the burning. The result in the case of the candle is a number of gases which we do not notice, real though they be; but when various other things are burnt the result is not a gas at all, but sometimes a liquid and sometimes a solid. When

the gas hydrogen is burnt or combined with oxygen, it forms water, which is usually liquid. When the element silicon is burnt or combined with oxygen, it makes a solid, and most rocks and sand are made of this. An ordinary stone or sand is really silicon which is already burnt, and so can be burnt no more. But coal is made mainly of carbon which is not yet burnt, and so it can be burnt. Burnt carbon—that is to say, carbon combined with oxygen—makes the gas called carbon dioxide, and that gas cannot be burnt any more than a stone can, and for the same reason. Both are burnt already.

HOW IS IT THAT ASBESTOS DOES NOT BURN?

I have put this question with the last, said the Wise Man, because the answer to it is really the same. Asbestos is already burnt, like stone or sand, and can be burnt no more. It is also very difficult to melt, and will not melt with the heat of an ordinary flame; and so it can be used for many purposes—to line safes, for gas-stoves, and so on. The very word is simply taken from the Greek, and means “unburnable.” Of course, both in this case and in the case of stone and sand, we cannot doubt that long ages ago all these things were made by being burnt or combined with oxygen when the earth was a very different place from what it is now. If you consider how much of the stuff in the crust of the earth is already burnt—that is to say, already combined with oxygen—if you consider that all water is already burnt, and if you remember how much oxygen there is in the air even yet, you will understand how it is that about half of all the stuff we know consists of oxygen.

WHAT IS SMOKE MADE OF?

Smoke is the result of imperfect burning. Most of the things from which we get so much smoke—like coal—if they were properly burnt, would form nothing but gases, which we could not see, and which would very soon fly away and do no harm to anybody. But in order to burn coal properly some trouble and care are required. When we burn coal in an ordinary fire, we do not supply enough air to it. We put the fresh coal on at the top instead of at the bottom, as we should, and so we

only partly burn the coal, and small specks of it, unburnt, are carried up in the draught, and make smoke. The chief stuff in smoke is simply coal, in specks of various sizes. But the trouble is that a great deal of oily stuff comes out of the coal, and covers the specks of it in smoke, so that these stick to things. We all do wrong in this respect in our fires at home, and the time will come when we shall make our fireplaces differently, so that we can burn our coal in a better way.

At present the smoke makes black fogs in many cities, and cuts off a great quantity of the daylight by which we live, besides making everything dirty, destroying plants and trees, and filling our lungs with dirt which we never get rid of. There are few things about which we are more careless than smoke, and if we had sense enough we should stop making it, even if it were only for the reason that all the stuff in smoke might be burnt, and that so in making smoke we waste a great deal of our fuel.

WHY DO BIRDS NOT FALL TO THE GROUND?

We know, of course, that there is such a thing as the air, a great ocean just as real as the ocean of water; and the flying of the bird is really very like the swimming of the fish. But, of course, if a bird stops flying it will drop, for its body is heavier than the air. Everyone knows this who has shot birds for fun; but I hope you have never done that. Though the bird's body is heavier than the air, yet it is very light, and is most beautifully made, so as to be as light as possible. There are great spaces in its body which are filled with air, and its bones are light though very strong.

Still, though this helps the bird, of course, yet all the same its body is heavier than the air, and it will fall unless it uses its wings. The bird knows this, and sometimes it wants to fall quickly. It folds its wings and simply drops as you or I would if we fell out of a balloon. The strongest muscles in the bird's body are those which press the wing downwards, and if it uses them quickly enough, this keeps its body up or even raises it. When we swim we do what is really just the same thing, though it is not nearly such hard work to swim, really, as it is to fly. No machine that man has ever made is as

clever as a bird for flying, because there is no machine in the world that can do so much work as a muscle in proportion to its weight. If only man did not have to take with him up into the air the engine that gives him his power, then he could make flying machines easily enough.

WHAT MAKES A KITE FLY?

The case of the kite proves to us that the air has a great power of holding things up, since the kite has no wings, and yet it does not fall. The air supports it. If you took all the stuff of which a kite is made and rolled it into a tight ball, it would drop like a stone.

So it is not that the kite is made of something lighter than the air. A balloon flies, we know, because it is filled with something lighter than air, but the kite has no light gas inside it, and yet it does not fall. The reason is that it is spread out as wide as can possibly be, so that it may have a large surface for the air to support it. But, of course, if there were no air at all the kite would drop at once, just as the bird would, whether it were flying or not. Neither the kite nor the bird could rise or swim in nothing. Now, the Latin word meaning empty is *vacuus*, and a place that is quite empty, even of air, is called a *vacuum*. Nothing can soar in a vacuum.

HOW CAN WE TELL THE AGE OF A TREE?

In the case of some trees, said the Wise Man, you can only guess at this, but in the case of many you can tell exactly, because the tree makes a fresh growth every year under the bark, and as this differs rather in the earlier part of the year from the kind of wood which is made later, you can easily distinguish between one year's growth and the next. So when the tree is cut across—but that, of course, means killing it—you find that it shows a number of rings, one inside the other, and each of these rings corresponds to a year of the tree's life.

In the case of a man or a woman, the number of years he or she has lived need not make any difference or leave any mark. Some people are far younger at eighty than other people at thirty, for we do not live by the changing seasons of the year. But all plants do this in some degree or other, and thus they show the marks of their age.

Another way in which trees differ from us is that, as long as they are alive, they go on growing, whilst we, of course, are quite different, and after the earlier part of our lives is past we never grow any more. Some trees live to be many hundreds of years old, even 1000 years or more.

WHY DOES THE BARK GROW ON A TREE?

If the bark did not grow on the tree, the tree would not grow. The bark is a necessary part of the tree, and if you strip the bark off you will kill the tree. In the first place, the bark does one or two things which are useful but not very important. The outside of it is usually pretty tough, and has become more or less dead (like the outside of our skin) so that things do not hurt it, and it protects the living part of the tree inside. Often many animals and humble plants live on the outside of trees without doing them any harm, but that is really a very small thing. The *inside* of the bark is the most living part of the tree, we may say; not only so, but it actually makes the tree. All the growth of the tree in thickness is due to the making of the wood, and it is the bark, the soft living part of the inside of the bark, that has made all the hardest wood of the biggest and hardest tree-trunk. Also, there are channels in the bark through which the sap of the tree, its food and water, runs, in much the same way as the blood runs in our own blood-vessels.

WHAT ARE CLOUDS MADE OF?

One of the reasons why we know that there is no water, or scarcely any water, on the moon is that we never see the slightest hint of a cloud when we look at it. If there were people on the moon looking at the earth, they would constantly be finding that the face of the earth was hidden from them by clouds. One of the things which we are studying now in the wonderful planet Mars is as to whether there are any clouds to be seen there, because, if there were, that would help to show that there is water on Mars. So, what I have said answers your question, does it not? Clouds are made of water. But there is water in the air everywhere. There is a quantity of it in the air of the room where you are reading this, or in the air around you—if you are so wise as to be reading in the

open air. Yet this does not make a cloud. The reason is that most of the water in the air is in the form of a gas; but the water of clouds is wet water—indeed, a cloud is made of many drops of water, which, when they fall, we call drops of rain. Men who study these things are now beginning to learn how it is that sometimes these drops stay in the cloud, and sometimes they fall and make rain. The water has come from the seas and great lakes, and has been drawn up by the sun.

HOW DOES A TRAIN KEEP ON THE RAILS?

We all think we know the answer to this question, said the Wise Man, and we are nearly all wrong. If you look at the wheels of a train you will see that they have a rim, or flange, on the inside, and people think that this keeps the train on the rails. If that was all there were, not a single train in America would ever reach the end of its journey. The real reason is in the way the wheel is made. These pictures will show you. The first shows you the sort of wheel that you would expect; the second shows the wheel as it really is. The wheel where it runs on the rail is cut slantways. If it were cut flat, so

as just to fit on the rail, no flange would ever keep the train on the rails. But the wheel cut slantways does what is wanted, because it is harder work for the wheel to ride on the part near the flange than on the part away from the flange.

That is to say, it is easier for the wheel to run where it is smallest, and the wheel is made smallest on the outside edge, so that both wheels press *outwards*, as it were. This means that if one wheel is pressing too far outwards the other is pressing *the other way*, and

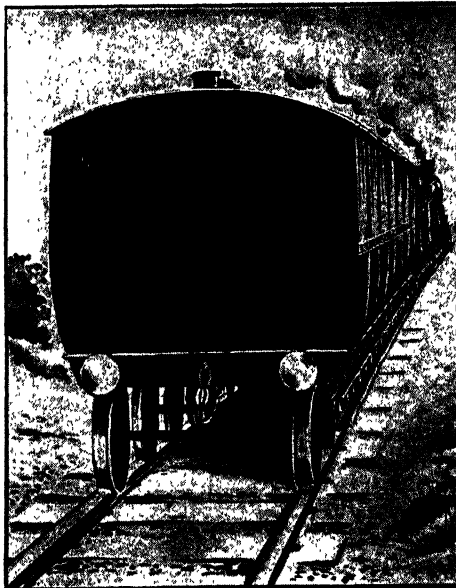
so the two wheels keep each other right. The wheel is really made up of several wheels together, the outer being smaller than the inner, and it costs the engine less work if the train rides on the smallest wheels—that is, if the outer part of the wheel-edge rides on the rail. Moving things always do the least work they can; that is to say, they always take the path of least trouble—like most little boys and girls, and grown people, too.

WHAT CAUSES A FOG?

People are very careless in the way they use the word fog, and we really need a new word. There is a kind of fog which is only a dense mist, and it is really just the same as a cloud, only it is near the earth, and is wider spread. When you go up through a cloud in a balloon, it is just like going through a thick mist. These fogs are, of course, very common at sea, for the obvious reason that they are made of water, and there is plenty of water there to make them of. But they are perfectly clean, and they probably do not injure our bodies at all. The real danger about them is that, at sea, they may prevent ships from seeing one

another, and so they may strike each other. But the kind of fog seen in some cities is a very different thing; it is mostly made of smoke, and someone has very well suggested that we should call it not "fog" but "smog," in order to remind ourselves that it is made of smoke. Now, in certain states of the air, and especially when the air is warm enough, smoke rises high into the sky, and is blown away and does not do very much harm, though, at the very least, wherever there is smoke there is

WHY A TRAIN KEEPS ON THE RAILS



Wrong way

A train keeps on the lines because the wheel is made so that it rests slantways. The cars in the picture are the kind used in Europe.



Right way

waste. But often when the air is cold the smoke gathers and settles in the form of a fog, or, rather, a "smog." This interrupts the traffic; it makes everything dirty; it eats away the surface of most beautiful buildings—especially in a great city like London, where there is a great deal of fog during the winter—and it makes thousands of people ill. Some day men will wonder that we were so silly as to allow this.

HOW IS A CORAL ISLAND MADE?

Over thousands of miles in the Pacific Ocean there are groups of low, ring-shaped islands, like the two shown in the picture, and for a long time men have wondered how they were made. We know now that they are actually made of

the hard parts of the bodies of countless millions of tiny living creatures belonging to the animal world. The stuff we call coral is really made of the skeletons of these little animals, all joined together. Coral islands have gradually grown around the shores of old volcanic peaks, as a result of the life and death of these tiny animals. They only live in

water, and so when the coral ring comes to the surface and makes a coral island it stops growing. The tiny animals on the outside of the coral colony get most food, and so grow more quickly and their bodies are piled up faster than those on the inside. So the ring is formed; and often a few cocoanut trees find a footing upon it, as we see in the picture, the seeds of the trees being carried to the island by the wind. We can only guess how many ages it takes for the peak to wear away and the ring to grow until enough land is formed on which trees grow. Most of what we know about coral islands was found out

by the English scientist, Darwin, and by Dana, an American.

WHY DOES A GALE BLOW GREAT TREES OVER AND LEAVE RUSHES STANDING?

Well, you might add, said the Wise Man, not only rushes, but also some kinds of trees, like the willow, which bend before the gale just as rushes do. The reason depends upon the difference in the wood of various trees; some are elastic, and some are not. The tree which is not elastic, but rigid, like the oak, will stand unmoved, so far as its trunk is concerned, in a very strong wind, though far less wind will make the rush or the willow bend, because it is nothing like so strong. But if the wind becomes a great gale the oak will break; the willow and the rush will bend as they

did in much less wind, and when the gale is over they will come upright again because they are elastic. If you strike a piece of string with a stick it will bend, but will not break; if you strike a thin stick with a thicker stick the thin stick will break. That is what happens in a gale of wind.

There is a very good lesson for us here. There are people who are like the oak; they

are strong and can stand a great deal, but they are rigid, and do not know when to yield or give in, and the time will come when they will, so to speak, break, whilst other people who are less strong will recover. But the wisest people and the strongest have the advantage of either the oak or the rush, for they can be strong as the oak when it is necessary, and can give in gracefully when that is necessary. Many great men in history were like this, but many bent and gave in to save themselves, even at the cost of their honor, when it would have been nobler to break altogether, even though that meant losing all their power.



A CORAL ISLAND MADE BY LIVING CREATURES
in the way described on this page

GOOD KING WENCESLAS WENT FORTH



PAGE AND MONARCH FORTH THEY WENT, FORTH THEY WENT TOGETHER,
THROUGH THE RUDE WIND'S WILD LAMENT, AND THE BITTER WEATHER

From the painting by Sheridan Knowles

The Book of POETRY



THE POETS AND CHILDHOOD

THE pure love of mother and father for their little ones is seen in the poetry of the different peoples, and in our own happy country the love of little children is stronger than in almost any other land. It is one of the many things that have helped to make our country great and powerful. In China little girls are despised by their parents, and used to be killed because their parents thought they had no use for them. But in China's neighbor, Japan, little children have always been loved as much as in our own land.

As we read the American poets we shall find that few indeed have not written poems for or about the little children. "Suffer the little children to come unto Me," said Jesus, and our poets seem ever to have regarded childhood as something sacred because Jesus first sanctified the love of children.

Big books might be made up of the poems on childhood. In our own Book of Poetry an immense number of pieces are about children. We have seen how such great poets as Longfellow and Tennyson and Browning loved to turn from the graver subjects to write for children. But we have also seen that a vast amount of general poetry written not specially for young people can come into a child's book of poetry. There is a reason for this, and we will see if it can be made clear.

As a great thinker has wisely said, true genius is nothing more than the power to be children again at will. The genius is really a man whose head has grown old, but whose heart, like Peter Pan, has not "grown up."

CONTINUED FROM 828



He remains, in advanced years, young in heart. Now, all the beautiful things of this world are seen best and understood best by the simple-hearted. Did not Jesus say that only "the pure in heart" shall see God? Nay, more. He said, "Except ye be converted, and become as little children, ye shall not enter into the kingdom of heaven."

This really means that grown-up people must go back to the simple faith and pure-heartedness of childhood. What a grand thought is here for all young people! The whole glory of the world is with the young, because they have simple hearts. So is it with most of our great poets. Tennyson and Longfellow, being men of genius, had this power to "convert" themselves into little children at will; with all the buffeting of life's daily battle, all the trials of faith which must be met by each one of us, their simplicity of heart remained.

This really explains why so much of our poetry is suitable for boys and girls, and also why so much good poetry has been written by our lesser poets especially for children. This splendid inheritance of the poetry of childhood is something of which all our boys and our girls have good reason to be proud.

Another thing is indicated by what we have just said—that while a great amount of our poetry has been written for boys and girls, there is no reason why that should be the only class of poetry they should read. Boys and girls may read all that is best in poetry just as well as their mothers and fathers can read it.

GOOD KING WENCESLAS

All over the world where carols are sung in the English tongue this carol of "Good King Wenceslas" is sung at Christmas-time; but the lesson it teaches of a king's humility is appropriate at all times, for people as well as for kings, and we cannot learn this lesson too well.

GOOD King Wenceslas looked out
On the feast of Stephen,
When the snow lay round about,
Deep and crisp and even.
Brightly shone the moon that night,
Tho' the frost was cruel;
When a poor man came in sight,
Gathering winter fuel.

"Hither, page, and stand by me,
If thou know'st it telling—
Yonder peasant, who is he,
Where, and what, his dwelling?"
"Sire, he lives a good league hence,
Underneath the mountain,
Right against the forest fence
By Saint Agnes fountain."

"Bring me flesh and bring me wine,
Bring me pine-logs hither;
Thou and I will see him dine,
When we bear them thither."
Page and monarch forth they went,
Forth they went together,
Through the rude wind's wild lament,
And the bitter weather.

"Sire, the night is darker now,
And the wind blows stronger;
Fails my heart I know not how—
I can go no longer."
"Mark my footsteps, good my page,
Tread thou in them boldly;
Thou shalt find the winter's rage
Freeze thy blood less coldly."

In his master's steps he trod,
Where the snow lay dinted.
Heat was in the very sod
Which the saint had printed.
Therefore, Christian men, be sure,
Wealth or rank possessing,
Ye who now will bless the poor
Shall yourselves find blessing.

THE GREEDY BOY

In the early years of last century Mrs. Elizabeth Turner wrote "The Daisy," and other books named after flowers, for children. They were quaint little books of prose and verse, and the following lines are taken from one of them.

SAMMY SMITH would drink and eat
From morning unto night;
He filled his mouth so full of meat,
It was a shameful sight.

Sometimes he gave a book or toy
For apples, cake, or plum;
And grudged if any other boy
Should taste a single crumb.

Indeed, he ate and drank so fast,
And used to stuff and cram,
The name they call'd him by at last
Was often Greedy Sam.

THE YOUNG MOUSE

This has been a children's favorite for eighty years or more. It was written by Jeffreys Taylor, a brother of Jane and Ann Taylor, who wrote so many well-known children's poems, and it deservedly ranks high among the verses of its kind.

IN a crack near a cupboard, with dainties
provided,
A certain young mouse with her mother re-
sided;
So securely they lived on that fortunate
spot,
Any mouse in the land might have envied
their lot.

But one day this young mouse, who was given
to roam,
Having made an excursion some way from her
home,
On a sudden return'd, with such joy in her
eyes
That her grey sedate parent express'd some
surprise.

"O mother!" said she, "the good folks of
this house,
I'm convinced, have not any ill-will to a
mouse;
And those tales can't be true which you always
are telling,
For they've been at the pains to construct us
a dwelling.

"The floor is of wood, and the walls are of
wires,
Exactly the size that one's comfort requires;
And I'm sure that we should there have nothing
to fear,
If ten cats with their kittens at once should
appear.

"And then they have made such nice holes in
the wall,
One could slip in and out with no trouble at
all;
But forcing one through such crannies as
these
Always gives one's poor ribs a most terrible
squeeze.

"But the best of all is, they've provided us
well,
With a large piece of cheese of most exquisite
smell;
'Twas so nice, I had put my head in to go
through,
When I thought it my duty to come and fetch
you."

"Ah, child!" said her mother, "believe, I
entreat,
Both the cage and the cheese are a horrible
cheat.
Do not think all that trouble they took for
our good;
They would catch us and *kill* us all there if
they could,
As they've caught and killed scores; and I
never could learn
That a mouse, who once entered, did ever
return!"

Let the young people mind what the old people
say,
And when danger is near them keep out of the
way.



I REMEMBER, I REMEMBER

In this famous poem by Thomas Hood the author seeks to endear to us the pure joys of childhood, the happiest years of all. Memory is the friend of old people, for it enables them to recall the happy days of long ago, days which now exist for all boys and girls. There is a tone of sadness in Hood's poem, as he knew sorrow and much ill-health when he was a man. A happy, healthy childhood is the most lasting of all the joys on earth; something worth remembering.

I REMEMBER, I remember

The house where I was born,
The little window, where the sun
Came peeping in at morn;
He never came a wink too soon,
Nor brought too long a day;
But now I often wish the night
Had borne my breath away!

I remember, I remember

The roses, red and white,
The violets and the lily-cups,
Those flowers made of light!
The lilacs, where the robin built,
And where my brother set
The laburnum on his birthday
The tree is living yet!

I remember, I remember

Where I was used to swing,
And thought the air must rush as fresh
To swallows on the wing.
My spirit flew in feathers then,
That is so heavy now;
And summer pools could hardly cool
The fever on my brow!

I remember, I remember

The fir trees, dark and high;
I used to think their slender tops
Were close against the sky:
It was a childish ignorance,
But now 'tis little joy
To know I'm farther off from Heaven
Than when I was a boy

THE HOMES OF ENGLAND

Mrs. Hemans was a favorite poetess in the days of our grandfathers. She died in 1835. Though not a great writer, yet she composed many beautiful poems, which will not soon be forgotten, as her words were sweet and her thoughts were full of kindness and love. This delightful poem presents the verdant charm, beauty and variety of the homes of England.

THE stately homes of England!

How beautiful they stand,
Amidst their tall ancestral trees,
O'er all the pleasant land!
The deer across their greensward bound,
Through shade and sunny gleam;
And the swan glides past them with the sound
Of some rejected stream.

The merry homes of England!

Around their hearths by night,
What glad looks of household love
Meet in their ruddy light!
There woman's voice flows forth in song,
Or childish tale is told,
Or lips move tunelessly along
Some glorious page of old.

The blessed homes of England!

How softly on their bowers
Is laid the holy quietness
That breathes from Sabbath hours!
Solemn, yet sweet, the church-bell's chime
Floats through their woods at morn;
All other sounds, in that still time,
Of breeze and leaf are born.

The cottage homes of England!

By thousands on her plains,
They are smiling o'er the silvery brooks,
And round the hamlet's fane.
Through glowing orchards forth they peep,
Each from its nook of leaves;
And fearless there the lowly sleep,
As the birds beneath their eaves.

The free, fair homes of England !
 Long, long, in hut and hall,
 May hearts of native proof be reared
 To guard each hallowed wall !
 And green for ever be the groves,
 And bright the flowery sod,
 When first the child's glad spirit loves
 Its country and its God !

THE FATHERLAND

While it is right that we should be proud of our native land, it is also right that we should not admire anything which is not noble and true, even if it is found in our native land. The true "Fatherland" means any country, anywhere, that can show deeds of mercy, justice, and brotherly love. That is what James Russell Lowell, our famous American poet, who wrote this poem, wants us to feel. In a word, we have to admire these grand qualities wherever we find them, whether it be in America or in any other country in the world.

WHERE is the true man's fatherland ?
 Is it where he by chance is born ?
 Doth not the yearning spirit scorn
 In such scant borders to be spanned ?
 Oh yes ! his fatherland must be
 As the blue heaven, wide and free !

Is it alone where freedom is,
 Where God is God and man is man ?
 Doth he not claim a broader span
 For the soul's love of home than this ?
 Oh yes ! his fatherland must be
 As the blue heaven, wide and free !

Where'er a human heart doth wear
 Joy's myrtle-wreath or sorrow's gyves,
 Where'er a human spirit strives
 After a life more true and fair,
 There is the true man's birthplace grand,
 His is the world-wide fatherland !

Where'er a single slave doth pine,
 Where'er one man may help another—
 Thank God for such a birthright, brother—
 That spot of earth is thine and mine !
 There is the true man's birthplace, grand,
 His is a world-wide fatherland !

WISH

Samuel Rogers, who died in 1855, was a wealthy banker and the friend of many poets and literary men. He wrote a good deal of poetry, but not of a very high order. "A Wish" is a pretty little poem in praise of the simple country life, and it is interesting to know that its author lived in a splendid mansion all his life. How true it is that we most admire those things which we have not got !

MINE be a cot beside a hill ;
 A beehive's hum shall soothe my ear ;
 A willow brook that turns a mill
 With many a fall shall linger near.

The swallow, oft, beneath my thatch,
 Shall twitter from her clay-built nest ;
 Oit shall the pilgrim lift the latch,
 And share my meal, a welcome guest.

Around my ivied porch shall spring,
 Each fragrant flower that drinks the dew ;
 And Lucy, at her wheel, shall sing
 In russet gown and apron blue.

The village church among the trees,
 Where first our marriage vows were given,
 With merry peals shall swell the breeze
 And point with taper spire to heaven.

THE SHIP OF STATE

The Constitution and Laws of the land are here personified and addressed in lofty verse as the "Ship of State," by the widely loved household poet, Henry Wadsworth Longfellow.

SAIL on, sail on, O Ship of State !
 Sail on, O Union, strong and great !
 Humanity, with all its fears,
 With all the hopes of future years,
 Is hanging breathless on thy fate !
 We know what Master laid thy keel,
 What Workmen wrought thy ribs of steel,
 Who made each mast, and sail, and rope
 What anvils rang, what hammers beat,
 In what a forge and what a heat
 Were shaped the anchors of thy hope !
 Fear not each sudden sound and shock—
 'Tis of the wave, and not the rock ;
 'Tis but the flapping of the sail,
 And not a rent made by the gale !
 In spite of rock, and tempest roar,
 In spite of false lights on the shore,
 Sail on, nor fear to breast the sea !
 Our hearts, our hopes, are all with thee.
 Our hearts, our hopes, our prayers, our tears,
 Our faith, triumphant o'er our fears,
 Are all with thee, are all with thee !



THE MOUNTAIN AND THE SQUIRREL

Emerson was a famous American writer and thinker. He was seldom humorous in his poems, but this is one of the exceptions. Though the verse is humorous, its lesson is quite serious, for it reminds us that we have each our particular work to do and our special abilities for doing it. The all-wise Creator has not made us all alike, each of us has different talents, and we must do our best with the gifts He has given us.

THE mountain and the squirrel
 Had a quarrel,
 And the former called the latter "Little
 prig ;"
 Bun replied,
 "You are doubtless very big ;
 But all sorts of things and weather
 Must be taken in together
 To make up a year,
 And a sphere.
 And I think it no disgrace
 To occupy my place.
 If I'm not so large as you,
 You are not so small as I,
 And not half so spry ;
 I'll not deny you make
 A very pretty squirrel track.
 Talents differ ; all is well and wisely put ;
 If I cannot carry forests on my back,
 Neither can you crack a nut."

LITTLE VERSES FOR VERY LITTLE PEOPLE

THERE WAS AN
OLD WOMAN
WHO LIVED
IN A SHOE



SHE HAD SO MANY CHILDREN
SHE DIDN'T KNOW WHAT TO DO;
SHE GAVE THEM SOME BROTH
WITHOUT ANY BREAD,
SHE WHIPPED THEM ALL SOUNDLY,
AND SENT THEM TO BED . . .



LITTLE VERSES FOR VERY LITTLE PEOPLE

There was an old woman, as I've heard tell,
She went to the market, her eggs to sell;
She went to the market all on a market day,
And she fell asleep on the king's high-way.

There came by a pedlar, whose name was Stout,
He cut her petticoats all round about:
He cut her petticoats up to the knees,
Which made the old woman to shiver and freeze.

When the little woman first did wake,
She began to shiver and she began to shake,
She began to wonder and she began to cry:

"Oh, deary, deary me, this is none of I!

"But if it be I, as I do hope it be,
I've a little dog at home and he'll know me;

If it be I, he'll wag his little tail,
And if it be not I, he'll loudly bark and wail."

Home went the little woman all in the dark,

Up got the little dog, and he began to bark;

He began to bark, so she began to cry:

"Oh, deary, deary me, this is none of I!"



LITTLE VERSES FOR VERY LITTLE PEOPLE

LITTLE Boy Blue, come blow up your horn,



The sheep's in the meadow,
the cow's in the corn ;
But where is the boy that
looks after the sheep ?
He's under a haycock, fast
asleep.
Will you awake him ? No,
not I ;
For if I do he'll be sure to
cry.

IN April,
Come he will ;
In May,
He sings all day ;
In June,
He changes his tune ;
In July,
He makes ready to fly ;
In August,
Go he must.

MULTIPLICATION is vexation,
Division is as bad ;
The Rule of Three perplexes me,
And Practice drives me mad.

POLLY, put the kettle on,
Polly, put the kettle on,
Polly, put the kettle on,
And let's drink tea.



Sukey, take it off again,
Sukey, take it off again,
Sukey, take it off again,
They're all gone away.

HE that would thrive
Must rise at five ;
He that hath thriven
May lie till seven ;
And he that by the plough would
thrive,
Himself must either hold or drive.

THE cock's on the housetop, blowing
his horn ;
The bull's in the barn, a-threshing of
corn ;
The maids in the meadows are making
of hay ;
The ducks in the rivers are swimming
away.

THREE BLIND MICE

Three blind mice ;..... See how they run ! They

all run af - ter the far-mer's wife, Who cut off their tails with the carv-ing knife, Did

ev - er you see such a sight in your life As these three blind mice ?...

PUZZLE PICTURES FROM ENGLISH HISTORY



The death of Harold. Find William the Conqueror.



Edward the First with his troops. Find Robert Bruce.



A charge at the battle of Blenheim. Find a number of generals.



Charles the First. Find Oliver Cromwell.



The Duke of Wellington on his horse. Find Napoleon.



A LITTLE GARDEN MONTH BY MONTH

WHAT TO DO IN THE MIDDLE OF JUNE

JUST as it is necessary to stake and tie plants as soon as they need it, so it is necessary to "stick" our sweet peas.

The pea-sticks must be sufficiently high, and they must be placed firmly in the ground. It may be necessary to put a few small branches among the plants to help them during their early stages, if the sticks are rather bare at the base. Where proper pea-sticks are not available, ordinary stakes must be used, with string wound from one to another, upon which the peas can grow. Not only must we provide support for the sweet peas, but all other climbing plants must have something upon which to grow. Nasturtiums are very pretty trained over an old tree-stump, as our picture shows, but it must be in a sunny position.

If the edging of the little garden plot be of live box, this may be neatly trimmed, so that everything shall be tidy and trim for the summer; empty pots should be cleared away directly they are done with, and weeds should be removed as soon as they appear.

It may be that we have among our spring flowering plants some beautiful double or large single violets. Now, it happens that, if we want them to produce as many flowers as possible, we must not forget our violet plants during any part of the summer. Frequently, in dry weather, they will need watering, and we shall see from the old plants long shoots, or *runners*, appearing from time to time. A great deal of the strength of the plant goes to the runners if these are allowed to remain, so that directly they are noticed they should be removed, and a look-out will have to be kept all through the summer and autumn.

But supposing we find that these runners have so far developed that they have almost the appearance of little plants? It is just possible they may even have struck root. These may be removed, and planted, and, whether they have roots or not, fine young plants will soon be formed. Some keen young gardeners will wonder if it is possible to have flowers in late autumn and winter.

CONTINUED FROM 849.



This is quite possible, and it is this that makes violets so prized and useful. If we take care of our violet plants now, and if there happens to be a garden frame we can use, we may plant them in this frame in the early autumn, and we shall be able to pick a fine bunch of flowers before

winter.

Where we have a rose-tree or two, a sharp look-out must be kept for green fly: these little pale green insects infest the leaves and growing flower-buds. Many washes are recommended to destroy them, but there are few ways of getting rid of them better than clearing the leaves with the fingers, where it means only one or two bushes to deal with. Roses are thirsty, greedy things, and if a little liquid stable manure be mixed with the water that is given them, the roses will be finer and more numerous.

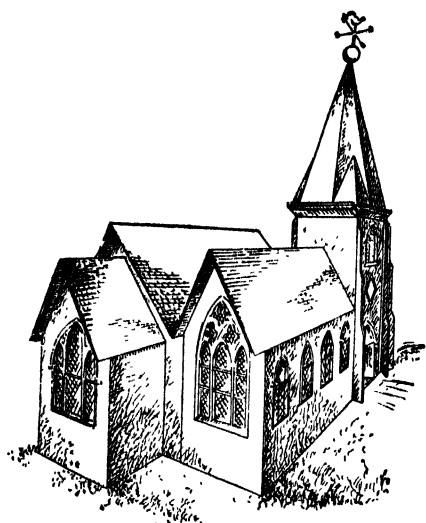
Where a very fine blossom is wanted, say, for instance, to exhibit at a show, only one flower-bud is allowed on the branch, and all the others are pinched off while still quite small. This is called *disbudding*.

It is sometimes a matter of great difficulty to water rose-trees, or indeed any plant growing on a bank, and as some of our garden plots will be so situated, it will be helpful to tell how to overcome the difficulty. We may take a rose-tree as an example. We water, but the moisture runs along the surface and very little sinks into the ground where we desire to have it. Beside the stem of the rose-tree, and on the top side of it, we may dig a hole just large enough to sink a small flower-pot to the rim. Into this the water can be poured, and it can be filled up again and again, and a great deal more water will reach the roots by this simple device than otherwise would be possible.

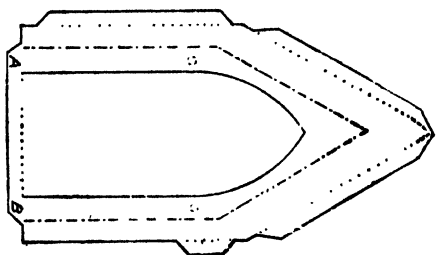
If hard tap-water has to be used for watering any of our plants, it is a good plan to draw it off in the morning, and expose it to the sun and air all day, as this helps to soften it and makes it of a more equal temperature with the atmosphere.

The ferns that we repotted in April must now be very carefully watered.

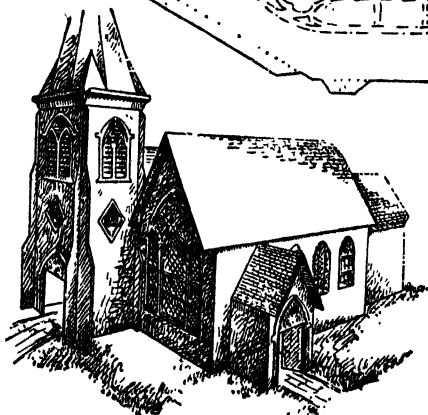
PLANS FOR A CHURCH IN MODELTOWN



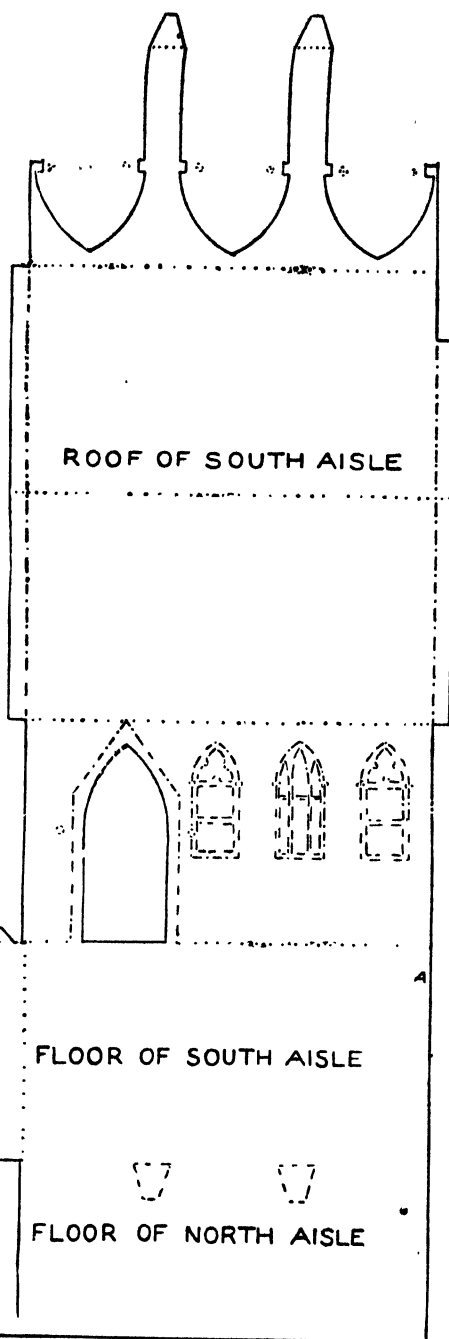
1. Design of the church from the back



2. Plan of end of south aisle : half-scale
Use scale-rule B



4. Church, showing side and front



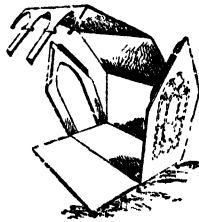
3. Plan of south aisle : half-scale
Use scale-rule B

THE BUILDING OF MODEL TOWN CHURCH

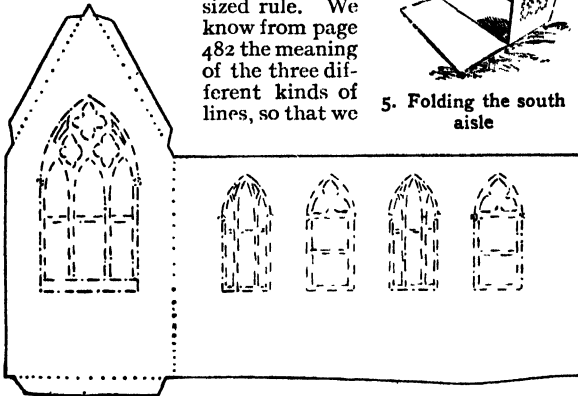
AS soon as a few houses have increased in number, and grown into a village, a church is erected. Every village has its church, and we must therefore add a church to Modeltown. But, because Modeltown is going to be more important than a small village, we must give it a handsome church. Up to now the people in Modeltown have used the school as a church; and a school-church is better than no church at all. But the time always comes when people want a real church, and this we shall now give our villagers or townspeople.

In pictures 1 and 4 we see what our church will be like. Picture 4 shows the church as seen from the front. This picture does not show the top of the tower with the weather-vane, but picture 1, which is a view of the church from the back, gives the tower complete.

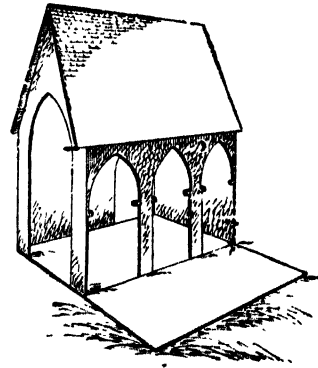
First we draw on our card and cut out the plans in pictures 2 and 3, which make the south aisle. The pictures are half-scale, so that we take the sizes with scale-rule B, and make the lines upon our card with our full-sized rule. We know from page 482 the meaning of the three different kinds of lines, so that we



5. Folding the south aisle



6. North aisle : half-scale. Use scale-rule B

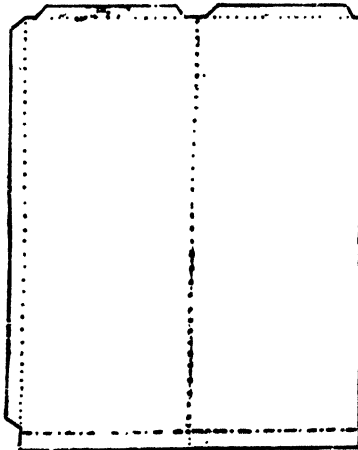


7. South aisle completed

do not need to go over all that again. Before folding up the cards which we have cut out, we glue the smaller portion of the south aisle, of which picture 2 is the plan, into its place on the floor of the aisle. The place marked A and B on picture 2 is glued to the place marked A and B on picture 3, and thereafter we treat the two pieces joined up as if they were one piece. Picture 5 shows the two pieces joined into one, and being folded up. Picture 7 shows them glued together and standing upright. It will be noticed that the feet of the two pillars, when bent over, rest upon the places marked on the plan in

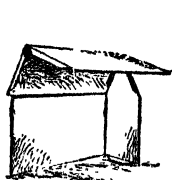
picture 3. These pillars must be glued down exactly into place, or the aisle will not be straight. The tops of the two end walls must be glued under the roof up to the chain line in picture 3, and this also must be neatly done if the church is to be neat and regular.

Now we come to the north aisle, the floor of which is already made as part of the south aisle. Picture 6 is the plan of the side wall and end of the north aisle, and is half-scale, so that when drawing it on the card we take the measurements with scale-rule B, making our drawing with the full-sized rule. Then we make the north aisle roof, the plan of which is given in picture 8. This also is half-scale, so again we use rule B in taking the measurements. Having made the roof, we glue it into position on top of the walls as seen in picture 9, after which we glue both to the south aisle and to the floor of the north aisle, which we made along with the south aisle. Having done this, we have completed the main body of the church, but have yet to make the chancel and tower. The plan of the chancel is shown

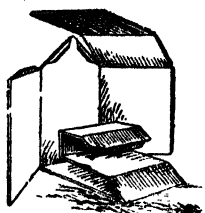


8. Plan of roof of north aisle : half-scale
Use scale-rule B

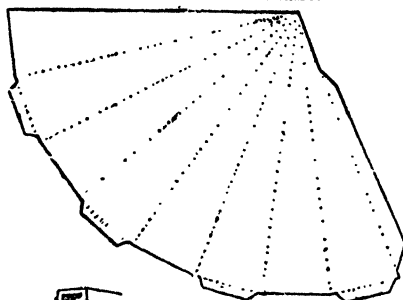
half-scale in picture 15, and we proceed to draw this on card, still using scale-rule B, and cut it out. Some of the dotted lines have small circles at each end. The card must be cut half through at these lines, not on the side of the card on which the drawing is made, but on the other side of the card. Part of this piece is the altar, and it requires careful bending up to be done neatly. Picture 10 indicates how it appears when being folded into the correct position, and picture 11 shows the altar and the raised floor of the chancel. Where the altar touches the end wall of the chancel, it must be glued in such a



9. North aisle, with roof

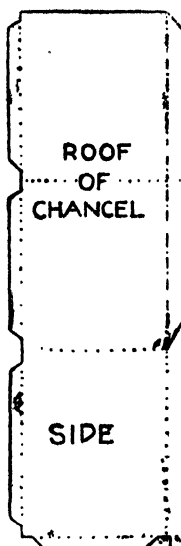


10. Folding the chancel



13. Cope of tower

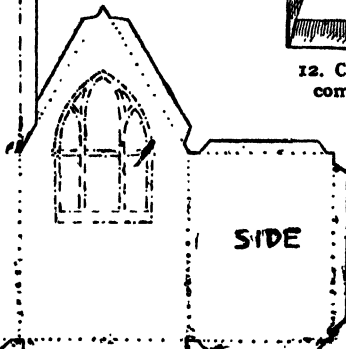
14. Plan of steeple half-scale
Use scale-rule B



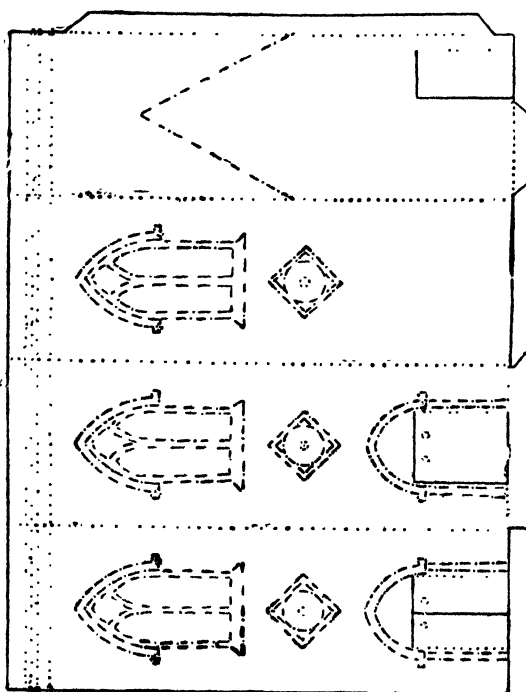
11. Altar floor



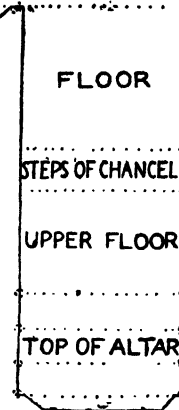
12. Chancel complete



16. Folding the tower



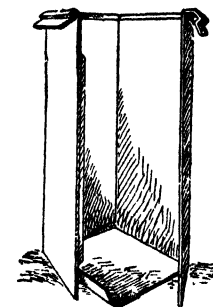
17. Plan of tower : half-scale. Use scale-rule B



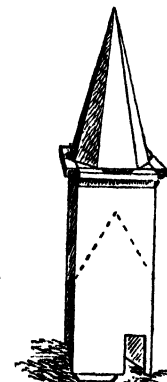
15. Plan of chancel half-scale
Use scale-rule B



18. Folding the steeple



19. Tower, with steeple



20. Plan of corners of steeple

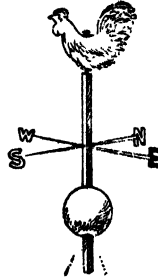
THE BUILDING OF MODEL TOWN CHURCH

position that the raised floor will be quite level. After gluing together, the chancel from the inside will appear as seen in picture 12.

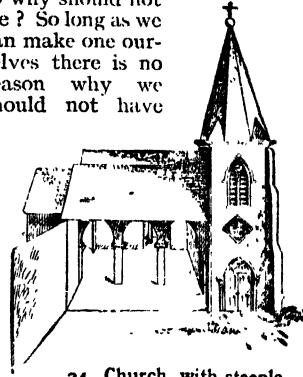
We now come to what is perhaps the most difficult piece of all—namely, the church tower. Its plan is given in picture 17, and is half-scale, so that we make it accordingly, taking our measurements from the picture with rule B, and making the lines upon the card with our full-sized rule. The tower is folded up as shown in picture 16. Care must be taken with the cope or moulding at the top; and picture 13 is intended to show us how this should be bent over so as to make the top look heavy and solid. The steeple is of rather irregular form. The plan

given in picture 22. The plans are half-scale, so that we use scale-rule B for the measurements. Having drawn and cut out two of each, we glue them to the front corners of the church tower, one of 21 and one of 22 to each corner, as shown in pictures 1, 4, and 24. The folded slips at the sides of the buttresses are glued to the sides of the tower. Then we make another buttress as plan 21, and another as plan 22, which we fix to the corners of the tower next the aisles, in the same way as we have fixed the buttresses to the front corners.

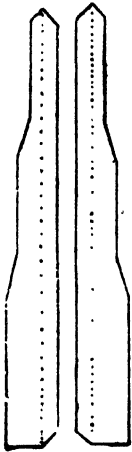
A good many churches have vanes, or weathercocks, so why should not we? So long as we can make one ourselves there is no reason why we should not have



23. Vane



24. Church, with steeple

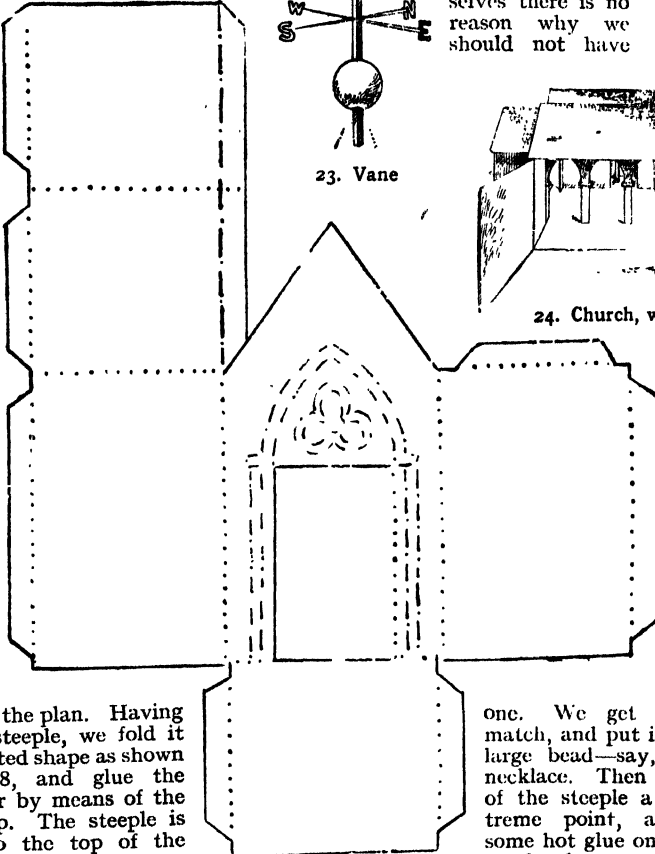


21. 22.

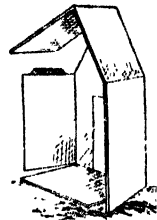
Buttresses: half-scale. Use scale-rule B

of it in picture 14 is half-scale—that is to say, we use scale-rule B in taking

the sizes from the plan. Having cut out the steeple, we fold it up into a pointed shape as shown in picture 18, and glue the edges together by means of the projecting slip. The steeple is now glued to the top of the tower, and will have the appearance of picture 19. It must be put on quite straight or the result will be very bad. The tower and steeple are not yet complete: we have to make four corner-pieces for the base of the steeple just above the tower. The plan of the corner-pieces is given full size in picture 20. We must make four of these, and glue them into place as indicated in picture 24. The tower can be strengthened and its appearance made better by adding some buttresses to it. There are four buttresses for the two corners at the front of the tower, two as the plan given in picture 21, and two as the



25. Plan of the porch actual size

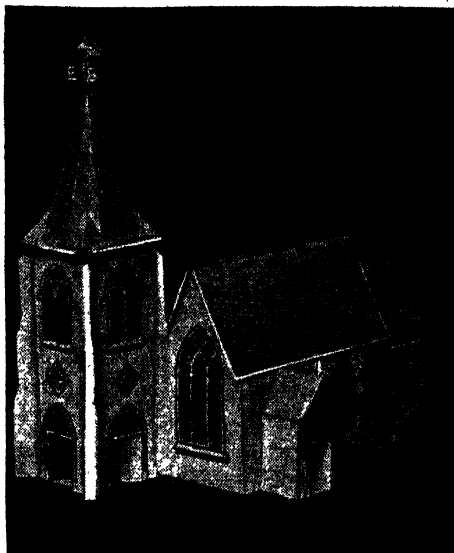


26. South aisle porch folded up.

one. We get a large wooden match, and put it through a fairly large bead—say, a bead from a necklace. Then we open the top of the steeple a little at the extreme point, and, having put some hot glue on the match below the bead, we push the match into the steeple until the bead is right on the top of the point of the steeple. Now we take two small, thin pins and push them half-way through the match, as seen in picture 23. The four letters, N., E., S., and W.—standing for North, East, South, and West—can be cut from any newspaper, but it will be better to cut them from a magazine or other book with thicker paper than a newspaper. A touch of glue or a little sealing-wax will enable us to attach the letters to the four ends of the two pins. We have only the cock to add to the top to complete the weathercock. We can make a

small drawing of a cock on thin card or thick paper and pass a pin through it vertically. This we push into the stem of the match, and then the weathercock, as in picture 23, is finished. The tower with steeple and buttresses is also finished, and may now be attached to the front of the church in the usual way. It is glued to the end of the north aisle that was left open, and its position is shown in picture 24.

Only one thing remains to be made—a porch for the side door of the south aisle. The plan for this is shown full size in picture 25, and in drawing it we therefore use the full-sized rule only. As it is being folded up it will appear as seen in picture 26, and picture 4 shows the position upon the aisle. That completes the structural part of the church,



Photograph of Modeltown Church as finished

instructions has been shown on this page. If we have followed the instructions carefully, the church that we have made will look like it.

which can be finished as we have finished many of the other buildings. We will make lines round all the windows to make them prominent, and the parts that represent glass we will color the usual blue. The doors will look well if we paint them dark red, and we can do this with red paint, or, if more convenient, with red ink, darkened with a few drops of black ink. We can make the roof a slate color, as it would probably be covered with slates in a real church. If you do not have a box of paints, you may use colored crayons instead. A church made according to these instructions has been photographed, and is shown on this page. If we have followed the instructions carefully, the church that we have made will look like it.

MUSTARD AND CRESS GROWN ANYWHERE AT ANY TIME

MOST people like mustard and cress, and it is at all times a very useful salad. A very interesting way of growing these little plants at any time of the year may be followed quite easily if the directions given are carefully observed.

All that we shall need for the purpose are a couple of wooden boxes, two pieces of clean flannel or blanket, measuring a little more than the boxes do, and, of course, a packet each of mustard and cress seed. The first thing to do will be to take away the lids of the boxes, and then, without damaging the sides, knock out the bottoms as well. Now we take the pieces of flannel and tie one over each frame.

Each of these must be stretched over the place where the bottom of the box was, and held down to the sides by tying a length of string all round. Thus we shall have something which will be like a square tambourine, only instead of parchment or paper there will be flannel. One of these boxes is for the mustard, the other for the cress.

As mustard seed grows much more quickly than cress, it should not be sown till later. We take the box which we are going to use for the cress and thoroughly wet the flannel. Now we get our packet of cress seed and open it, and sprinkle the seed fairly thickly over the flannel. The temperature should be kept fairly even, and not allowed to fall below 65° F.

It will be found that the seeds will stick well to the damp flannel and will not roll about. If we want the seed to grow very quickly, we shall put the box, when the seed has been sown, into a warm, dark cupboard. Twice a day the seeds should be looked at, and if it seems that they are at all dry they

must be well sprinkled with water. At the end of three days the seeds should have started into growth, and we shall be able to see the little shoots and roots breaking through the cases.

It is now time to sow the mustard seed, and this must be accomplished in just the same way as was adopted in the case of the cress. As soon as the seed has been sprinkled over the flannel, we remove the box in which it has been sown to a dark place, such as a cellar or any cupboard that may be available, where the seed will germinate, just as the cress did.

It will now be necessary to remove the box with the cress into the light; if it is summer we may place it in a sheltered place out of doors, but in winter the situation chosen should be in front of a window in a warm room. After another three days we may bring the mustard out into the light, and the two boxes can be placed side by side.

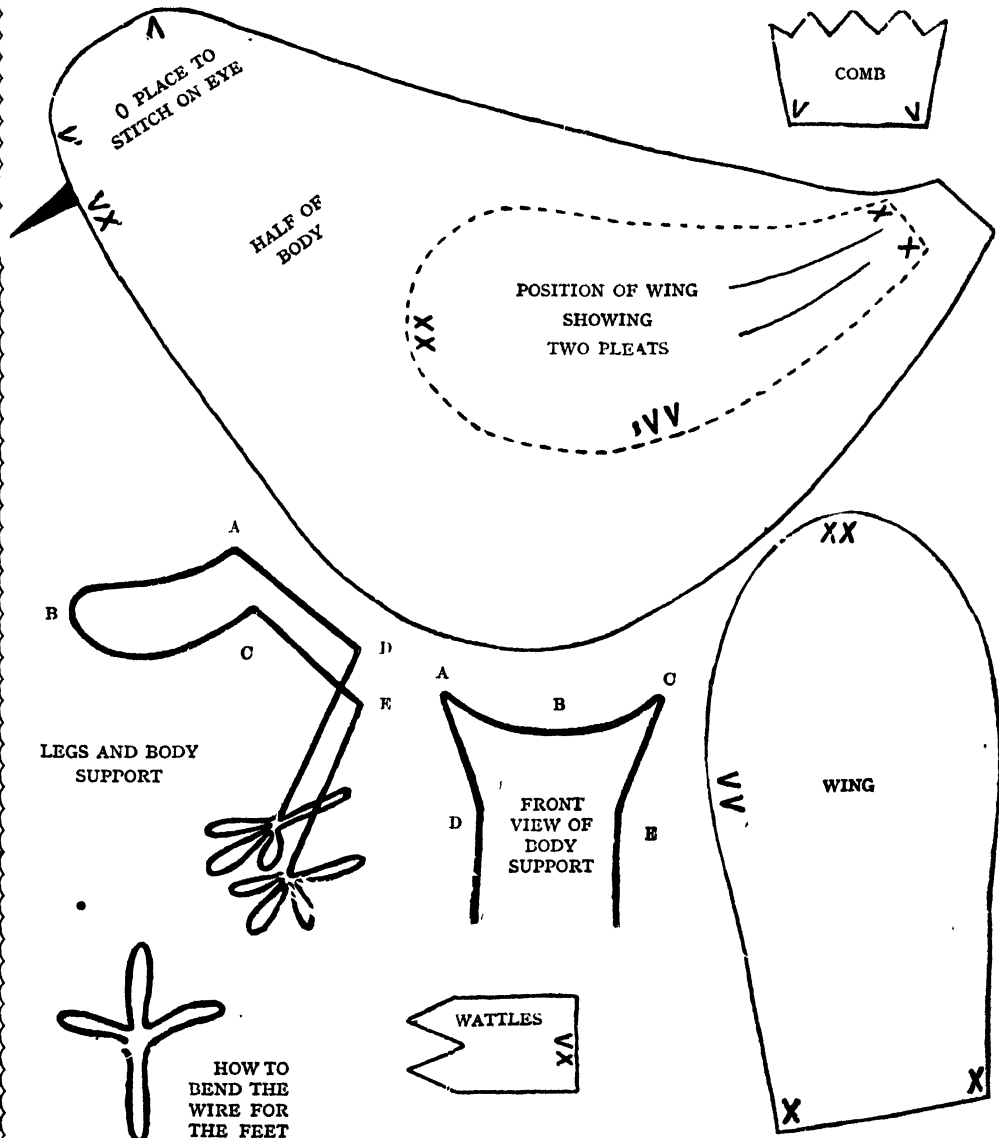
All this time it is most important that the seedlings should on no account be allowed to want for water. During the winter it will be found that, if the water is given just lukewarm, the plants will grow much more rapidly. When the seedlings are about two inches in height, it will be time to gather our crop of salad. With a good large pair of scissors the stalks may be cut close to the flannel, and they will be found to be very tender, as, indeed, will be the leaves of the little plants. Moreover, as there was no mould to make them dirty, a little washing will soon make them quite ready for use. A week later you may sow another box of seeds for a new crop.

THE BARN-DOOR COCK FOR OUR TOY ZOO

OUR barn-door cock is made of plush of any suitable color. A scrap of red flannel, or, better still, cloth, will be wanted for comb and wattles, and a piece of dark green silk or satin—"shot" silk, if you can get it—for his tail.


His body, having no under part, is very simple to make. Leave the tail end open for the insertion of the tail, as well as a little hole where we shall want to stick the beak in. The comb should be fixed in position at the outset, and sewn in with the seam on the top of the bird's head. The wings are turned

in at the edges and hemmed on to the body after it is stuffed, in the position shown, with two pleats as marked in the pattern. For the tail, cut a piece of silk four inches long and three inches wide; slit this for two inches of its width into quarter-inch strips, each of which may be slightly raveled out into a fringe at the tip and the edges. These are the tail feathers. Bind the part that is not slit round a piece of doubled wire about two inches long; curve the wire, and lightly tack some of the raveled strips on to it so as quite to hide it. You have then a plume. The



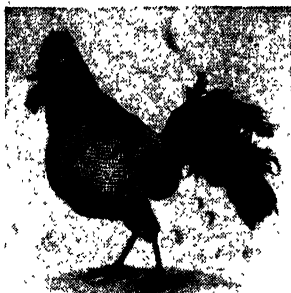
To be traced on tissue-paper and cut out
PATTERNS FOR THE COCK FOR OUR TOY ZOO

stem of the plume must be bent back till the whole wire is something like a figure 2. Then insert the straight part into the bird's body, and firmly sew it into position.

The legs, feet, and support of the body are *all in one*. It takes about sixteen inches of wire, bent as shown in the pattern. The thigh part must on each leg be covered with a piece of plush, shaped as shown here,  and leaving about an inch of length to spare at the wide end. A little wadding must be folded in with this covering when it is sewn on to the leg. When the legs are finished, make them stand on the table, and taking your bird's body, which should

also be quite finished, rest it on the frame, A B, in the pattern, to find out just where it must be poised to perfectly balance, otherwise your cock will never stand alone.

When you have found out the right position, be careful to fix it, by sewing A, B, and C to the bird's breast. Then the spare inch of plush at the tops of the legs must be turned in at the edge and hemmed on to the breast so as to hide the wire support entirely. The eye is a bright jet bead; the beak, a pointed and blackened splinter of wood. The red wattles sewn on just under it only remain to be added, and your cock-a-doodle is complete.

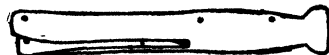


The cock for our toy Zoo

THE FIGHTING CLOTHES-PEGS

FEW toys afford more genuine amusement than this one, and few can be so easily and cheaply made. The material consists only of two round clothes-pegs, such as can be bought at any grocer's or hardware store, a few pieces of thin wire, which can be purchased at any plumber's or tin-shop, a pin, and a piece of strong black thread.

We first take two clothes-pegs and pierce them with holes at the places marked in picture 1. That will give us in each peg four holes in all—one about three-quarters of an inch from the top, one through the middle of the peg just above the legs, and one through each leg near the bottom. The holes should be made with a small bradawl, which ought to be sharp so as to make the holes clean without splitting the wood.



1. Clothes-peg, with holes



2. Body of peg



3. Slip for arm

Having made the holes, we cut off the legs right at the top where they are joined to the body of the peg, leaving the top of the peg as seen in picture 2.

Now we take two thin slips of wood about three inches long, and make three holes in each—one in the centre and one near each end, as seen in picture 3. We take the pieces of thin wire and join the slips of wood we have just made to the body of the pegs, one slip of wood to each side, as seen in picture 4. These slips do duty for arms, as can easily be seen from the picture. We bend over the wire at each end into the form of a loop, so that the arms will not slip off, but we must give room on the wire

so that the arms can work round very easily indeed. Then the wire outside the loops can be cut off if it is too long.

Now the legs must be attached, wires being put right through the lower hole in the body, and the legs put on the wire by the holes which we have made. These also must work

very easily, and the wire should be bent into loops at the ends and cut off just as when the arms were put on. We

now take a strong piece of black thread nine or ten inches long, and tie one end of it through the hole in the middle of one of the arms, making a loop at the free end of the thread. A long piece of black thread, say, two or three yards long, should be tied to the other arm, using the hole in the middle of the arm. Our wrestlers are now ready.

Through the loop at the end of the shorter thread we put a pin, and put it firmly into the carpet, as seen in picture 4. Then, if we take hold of the far end of the long thread, and hold it so that the wrestlers just touch the carpet with their feet, thereafter jerking the thread, the wrestlers will go through many amusing antics.

This toy looks very mysterious when the spectators do not see the thread.

It is then difficult to understand what makes the wrestlers jump about so. The best

4. The wrestlers ready for work

of the peg, leaving the top of the peg as seen in picture 2.

Now we take two thin slips of wood about three inches long, and make three holes in each—one in the centre and one near each end, as seen in picture 3. We take the pieces of thin wire and join the slips of wood we have just made to the body of the pegs, one slip of wood to each side, as seen in picture 4. These slips do duty for arms, as can easily be seen from the picture. We bend over the wire at each end into the form of a loop, so that the arms will not slip off, but we must give room on the wire



5. The wrestlers performing

way to conceal the thread is to work the toy on the carpet when it is a little dark, and when the fire is the only light in the room. Then, if the performer has a long thread, which he holds behind his back, as in picture 5, the mystery will be complete.

WHAT TO DO WITH A GIRL'S WORK-BASKET

5. THE LITTLE PETTICOATS

THE next little garment to be made is the flannel petticoat. The pattern of this is very easy, as we can see from pictures on this page. Picture 1 shows half the pattern. Cut this out in tissue-paper, and lay it on a piece of soft, fine flannel which has been folded in half, taking care that A B lies against the fold. Cut all round, *except between A and B*. To make the back seam, join the two edges as for running and felling, but instead of felling the edges, turn them over, and fasten them by herringboning them "*raw-edged*." The stitch is shown in picture 2. Leave a placket-hole at the top and make the edges neat by two tiny hems, herringboned, like the seam, to keep them flat. When you have gathered the material, regulate the gathers, so that the front of the petticoat is nearly flat, and all the fullness is at the back. These gathers do not need to be put into a band, as we shall see presently.

The next thing to do is to make the little bodice which has to be joined on to the petticoat. Look at picture 3, and you will see half of the very simple outline of the pattern needed to make this bodice. It is in one piece, and needs no seam except the tiny ones on the shoulders—that is, between E and C.

After you have drawn the design the right size to fit your doll, fold the piece of flannel in half and put the edge of the pattern marked A B on the fold of the flannel. Then pin it, and cut along the lines of the pattern, except between A and B, leaving enough for the turnings.

The dotted line in picture 3 is to show where to slope out the material for the front of the armhole. If you have forgotten why this should be done, turn to page 621, where we did the same thing.

After the seams on the shoulders have been done, either with a French seam or running and felling, the little bodice must be finished off at the top with buttonhole stitch to match the bottom of the petticoat. Buttonhole stitch, you will remember, we learned on page 621. To make the material strong at the back to hold the buttons and buttonholes, which have to be sewn next, a little hem, herringboned, should be made on each side. If we have cut our pattern correctly, we shall find that we have quite enough material for this without adding on any more. When the bodice is finished, the lower part of it is run on to the gathered

skirt, which we said did not need to be put into a band. Now we can understand why this was not necessary.

Join the bodice to skirt, then, by running stitches, as the little picture (4) shows. But it would be very untidy on the wrong side if we left the raw edges like this, would it not? So, to make it quite neat and dainty, a strip of nainsook is run along the gathers, and then turned over and neatly hemmed down just above. But the stitches must be very tiny ones, because, of course, they will show on the right side.

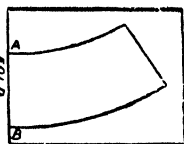
Trim the raw edge of the skirt part with buttonhole stitches, put on another button and buttonhole to fasten the waist-band, and your little flannel petticoat is finished, and will look like picture 5.

If you like to trim the bottom of the petticoat with a row of feather-stitching, about half an inch from the bottom, it will look all the more dainty.

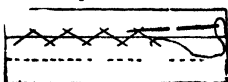
The white petticoat, which goes over the flannel one, is cut and made in very much the same way. The only difference lies in cutting out the skirt part and the trimming. The bottom should have two little tucks and a narrow hem, edged with tiny Valenciennes lace. These tucks and the hem will take up about $1\frac{1}{2}$ inches of material, so when we cut out the skirt part of the white petticoat it must be longer than the flannel one. It is so simple to cut out that no pattern is needed. It is simply a *straight* piece of stuff cut about $1\frac{1}{2}$ inches longer than the pattern of the flannel.

But the important thing to remember is to cut it "on the straight," not "on the cross"—that is, like the flannel one is cut. Material cut on the cross pulls very easily, and is difficult to tuck. Material that is cut on the straight—that is, in a straight line with the selvedge—is firmer and keeps its shape much better. The reason why we cut a flannel petticoat on the cross is, because it sets better and is less clumsy round the hips, for flannel is a clumsy material. The seams of the little white petticoat, which is much thinner than the flannel, should be run and felled, not herringboned.

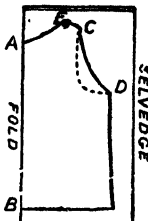
When the material is cut out for bodice and skirt part, and put together, make the hem and the two little tucks at the bottom, and trim the edge with lace, just like the picture (6) shows, and the little garment is finished. Our doll is nearly dressed now, for next time we shall make the doll's frock.



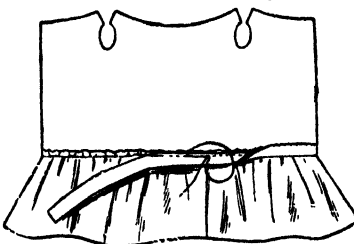
1. Pattern of flannel petticoat



2. Herringbone stitch



3. Pattern of bodice



4. Fastening bodice to skirt



5. The flannel petticoat



6. The white petticoat

HOW TO MAKE A LEATHER SUCKER

MUCH amusement may be had with a sucker. It is the simplest toy made, and also the least expensive, because if we have an old boot and a piece of stout string we have all the material necessary for making it. All we need then is a good sharp knife to cut the leather. The leather

we require must be not less than three inches across each way; it may be fairly stout leather, but not too thick, and the first thing we do is to

soak it well in water to make it soft. We may throw it into water and let it lie there all night or longer. When it has been made nice and pliable, make a hole in the middle of it. We can use a thin round wire nail to make the hole, driving it through the leather with a hammer.

The next thing is to make the leather round. We can mark the circle by using compasses, with the hole that we have already made as the centre; but there is a simple way of marking the circle without using compasses. We take a short piece of string and make a loop at each end, like picture 1, so that the two loops are from $1\frac{1}{2}$ to 2 inches apart. Then we put a nail through one loop and the hole that we have already made, and put another nail through the other loop, pressing its point

upon the leather. Keeping the string to its full extent, we now move the second nail right round in a circle, pressing all the time, and it will make a circular line as shown in

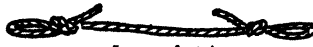
picture 2. By cutting the leather at this line we make a disc, which is the sucker. We can improve it a little by

trimming the edge on one side all round in the manner illustrated in picture 3. A good stout string, say, a bout three feet long, can now be put

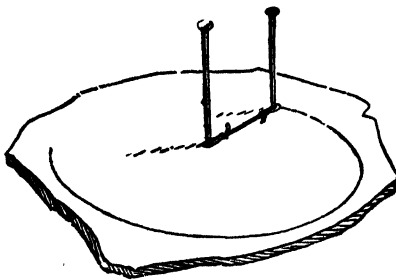
through the hole, and a knot made on its lower end to prevent it from slipping out again.

The sucker is now ready for use. Soak it in water well, then place it on a large smooth stone and press it down with the foot. The stone can now be lifted by pulling the string, the power of the sucker being great enough to resist the weight of the stone.

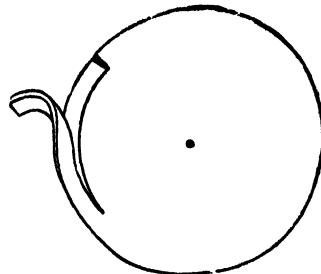
Why does the sucker act in the way that it does? Its behavior is explained by what we know of the weight, or pressure, of the atmosphere. The force with which we pull the string tries to draw the leather away from the stone, but instead of doing so it creates what we call a vacuum, or a space without air, under the leather, and the pressure of the outside air on the stone makes the stone stick to the leather.



1. Loop of string



2. Cutting the circle of leather



3. Trimming the edge of the sucker



4. Using the sucker

THE BOY CONJURER'S JOKE WITH HIS AUDIENCE

AT the end of a series of tricks it is often a source of great amusement to entertain the audience with what schoolboys call a "sell"—a practical joke in the disguise of a conjuring trick. The only apparatus needful is the pencil, and this you can manufacture for yourself. You have merely to change an ordinary pencil in such a way as to make it look like an extraordinary one. For instance, you may paint it in three colors—red, blue, and yellow, successive rings of each color; or, for lack of paint, colored paper may be used—anything, in fact, to give it an out-of-the-way appearance.

Having performed a few genuine tricks, you produce the pencil and a blank sheet of paper, inviting the company to examine them. "Now, ladies and gentlemen," you remark, "you notice, no doubt, that this is a rather peculiar-looking pencil. But its appearance is the least of its peculiarities. In point of fact,

it is an electric pencil. At present, you see, it writes plain black like any other pencil." Here you make a few marks with it and proceed: "But if I electrify it a little, it will write red, blue, or yellow—in fact, any color, just as I please. What color will you have? Choose for yourselves." "Red," we will suppose, is the reply. You gravely breathe upon the pencil, rub it upon your coat-sleeve, and proceed to write the word "Red" in bold letters. "There it is, you see—red. If you had asked for blue or yellow, it would have been just the same." Which nobody can deny.

The success of the trick rests on the fact that the audience have been prepared, by seeing sundry surprising things, to expect something equally surprising. If the trick were offered offhand, without such preparation, some of the audience would probably see through the joke; but if it is led up to in a proper manner, they will hardly ever do so.

CONTINUED ON PAGE 1095.

LITTLE PROBLEMS FOR CLEVER PEOPLE

THESE are continued from page 850, and the answers below refer to the problems given on that page.

WHAT WAS THE CARGO ?

52. A ship's cargo was unloaded by twenty-five barges, each barge taking three loads. But if each barge had been large enough to hold one hundred and sixty tons more, there would have been only one load each.

HOW MANY DUCKS ?

53. "How many ducks did you drive home?" asked Farmer Bell. "There were two ducks in front of a duck, two ducks behind a duck, and a duck in the middle."

What was the smallest number of ducks Farmer Bell could have had ?

WHEN WILL THEY MEET AGAIN ?

54. "My watch gains ten seconds an hour, and my clock loses ten seconds an hour," said Tomkinson. "I put them right at noon on June 1st, when will they be together again?"

Can you tell ?

HOW MUCH WAS THE PICTURE ?

55. "You can have that picture framed," said the dealer, "for \$12, or in another frame only half the value of this for \$10."

How much was the picture unframed ?

THE ANSWERS TO THE PROBLEMS ON PAGE 850

45. The cyclist lost the train by 20 minutes, and was misled by reckoning the average by distance and not by time. If he had an equal amount of time in walking, riding, and coasting, the average would have worked right. As it was, the 4-mile walk took 1 hour, the 4 miles of level road took $\frac{1}{2}$ hour, and the 4 miles of downhill took 20 minutes—in all, 1 hour and 50 minutes, while he had only $1\frac{1}{2}$ hours for the journey.

46. There is an odd $2\frac{1}{2}$ d. in the total, and no shillings; and the same is true of the cost of each rug. Therefore there must have been 1 rug more than a number which costs an exact number of pounds. Now, £1 is 96 times $2\frac{1}{2}$ d., so that 96 rugs is the smallest number which cost an exact number of pounds, the cost being £961. Therefore twice 96 cost £1922, which is within the right amount—that is, it consists of 4 figures, beginning with 1. Hence the number of rugs is 1 more than twice 96, which is 193; and the entry should have read: 193 rugs at £10 os. $1\frac{1}{2}$ d. each = £1932 os. $2\frac{1}{2}$ d.

47. The easiest way to do this is to subtract amounts with the pounds, shillings, and pence all equal—£1 1s. 1d., £2 2s. 2d., £3 3s. 3d., &c.—from £34, and see if any of them yield, as a result, a sum the shillings in which are double the number of pence, and the pounds in which are double the number of shillings. The two sums were £5 5s. 5d. and £28 14s. 7d., which, added together, make £34.

48. If he sold one house for \$4950 and made a profit of 10 per cent., the house must have cost him \$4500, because the difference between these two sums—\$450—represents 10 per cent. upon the price paid for the house originally. If he sold the second house at a loss of 10 per cent. he must have paid \$5500 for it, as \$550 is 10 per cent. of \$5500, the sum paid for it. Thus he lost \$100 exactly on the two transactions.

49. To walk at 4 miles an hour means 1 mile in 15 minutes, 5 miles an hour is 1 mile in 12 minutes. So, at the quicker rate, William takes 3 minutes less for each mile, but for the whole distance he takes 15 minutes less. Therefore, the number of miles is the number of 3's in 15—that is, 5 miles.

50. The man just caught the train at the second station. The train was 11 minutes late in starting, took 9 minutes to go to the next station, where it waited $14\frac{1}{2}$ minutes, making $34\frac{1}{2}$ minutes in all. The man started 12 minutes late, took $22\frac{1}{2}$ minutes to walk to the next station, also making $34\frac{1}{2}$ minutes in all.

51. The first day he reached 3 feet high before he slipped back, the second he reached 4 feet before he fell. Thus on the 27th day he reached 29 feet before he slipped back to 27 feet, and on the 28th day he reached 30 feet, but as he was at the top he did not slip back again.

Thus he took 28 days to climb to the top.

CONTINUED ON PAGE 1095.



ONE REASON WHY THE FORESTS ARE DISAPPEARING



The uses of wood are almost numberless, but here is one use which is growing day by day. These logs have now arrived at the pulp-mill where they will be ground up, as the first step in making paper. The newspaper your father reads in the morning may have grown in the depths of a Canadian forest. Think how many thousand trees are lying here beside the elevated track from which they have been dumped. You will be able to follow these logs until they are in the form of this book. It is no wonder that the forests are rapidly disappearing. Those in the United States will soon be gone. In some places spruce is planted especially for the making of paper.

Picture from Brown Bros.

The Book of FAMILIAR THINGS



THE WONDER OF A BOOK

A BOOK is one of the great marvels of the world. Perhaps a newspaper is more wonderful still, because a newspaper comes and goes almost in an hour, and yet it has in it the work of thousands of men. Your father buys a newspaper for one or two cents, and tears it up when he has done with it; yet that paper is something like a miracle, for it may have had its first beginning in a tree. Paper is made from pulp which is made from many things such as rags, flax, hemp, straw, grass, and jute. But the greater part of the paper made for newspapers and books comes from trees, which had lived and helped to make the world beautiful for many years.

The pictures on the following pages show us how our own book is made, from the very beginning of it to the moment it is ready for us. But it is not possible to give any idea in pictures of the great work and thought that go to make a book. Men must think about it, and write their thoughts on paper, and no pictures can show us how many men have been thinking for years and years about the things set down in our book. We can see the men cutting down trees; we can see the men making paper; we can see the printers at work. But the real thought that makes a book can never be seen.

When men first began to write, it must have seemed a wonderful thing to be able to write words that would make men *feel*, words that would make men laugh, or weep, or stir them to

CONTINUED FROM 841

do great things. As soon as men began to think at all, they wanted to put down their thoughts somewhere for other men to know; but there was not a single piece of paper then in all the world, and men scratched their thoughts on stone. They made clay bricks and stamped them with signs, like those on page 3479; for thousands of years these were the only books.

One of the greatest changes in the world has been the change from these books of long ago to the books that we read now. Nothing can show us more clearly the wonderful power of man and the wonderful way in which he has learnt the secrets of Nature. All that men think is written to-day in books, just as all that men have seen is painted in pictures. Nothing has been able to stop the men who write books. Kings have tried to stop them, great tyrants have burned their books, and writers have been tortured by fire. But nothing can ever destroy the power of writing or stop the growth of books, because books have spread themselves now throughout the world, and there is no part of the world without them. They are the only things that live for ever; because, although one book may perish, new copies are made as the old ones pass away.

And so through all the ages of time a book carries the thoughts of men. A thought put into a book is stronger than a statue carved in marble, and in the story of the world the pen has been far mightier than the sword.

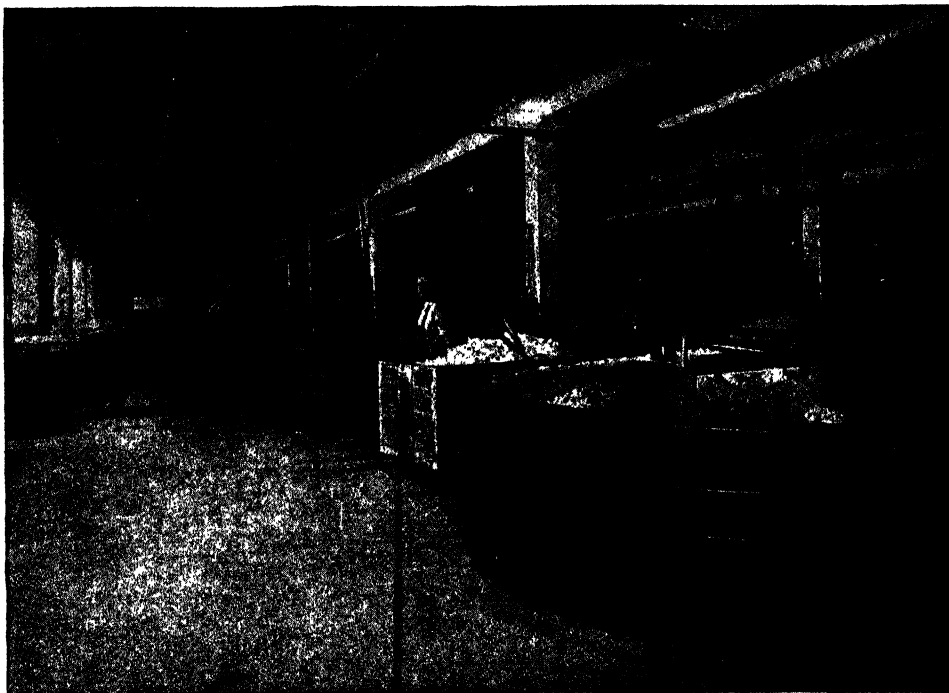
THE BEGINNING OF PAPER MAKING



After the rags have been sorted, dusted and cut into small pieces, they are placed in this rotary digester, where they are boiled for several hours with lime under steam pressure.



Next they are washed, beaten up and bleached. The result is a mass of fine white fibres such as you may see here.

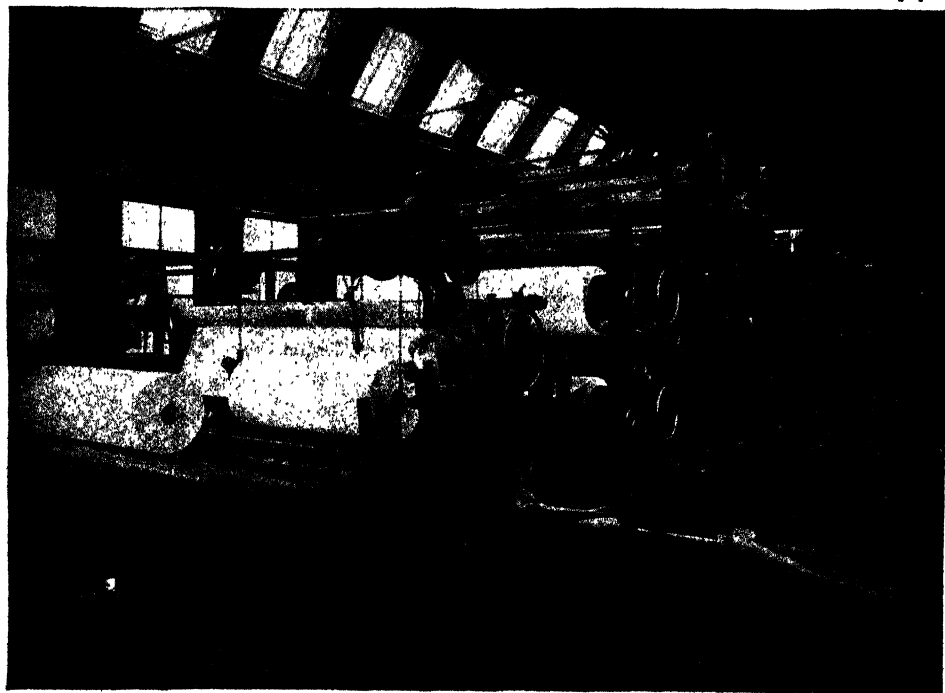


The pulp next goes to the beater, where the fibres are drawn out, separated and mashed up still further. In all except the very finest papers wood pulp may be added, and in fact much paper is made entirely of wood pulp. In these beaters fine clay and rosin are often added to fill up the pores and prevent the paper from absorbing too much ink. Color is also added at this stage, if colored paper is desired.

BOTH ENDS OF THE PAPER MACHINE



The fine pulp mixed with a great deal of water is then pumped into the vats you see here. After passing through screens to keep out lumps, it flows on to the moving flat bed of the paper machine. The bed is of fine wire cloth and the water drains away, leaving a thin film of pulp which soon becomes a sheet of paper.

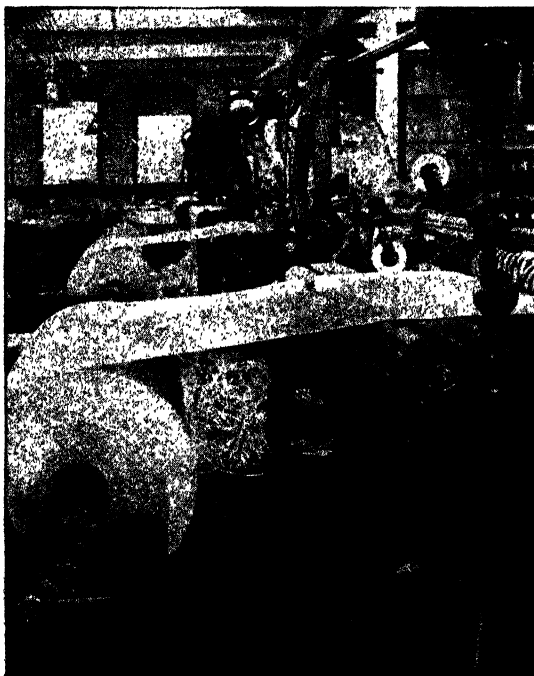


This is the "dry end" of the machine shown above. The film of pulp passes between felt rolls which squeeze out the water, metal rolls which smooth it, hot rolls which dry it and rolls which smooth it again. The finished paper eleven feet wide is here being split into strips and wound on metal or wooden rollers. Pictures of paper manufacturing by courtesy of S. D. Warren & Company.

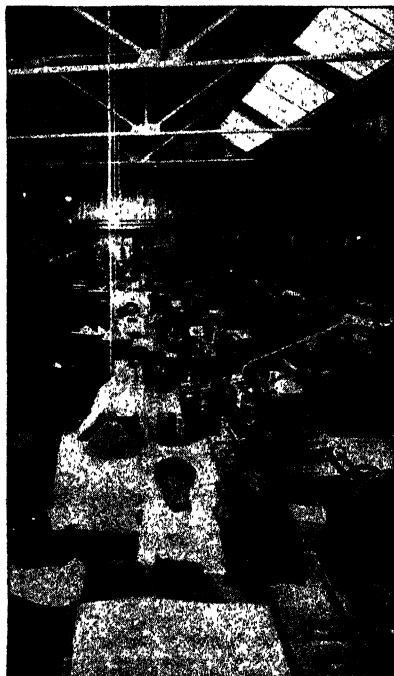
THE LAST PROCESSES IN MAKING PAPER



For very fine work the surface is not yet smooth enough. Here you see rolls of paper beginning the journey through a bath of coating mixture, composed of clay with glue and other things, some of which are secrets of the manufacturers. The paper is then dried in long galleries, rewound, and again passed between heavy calender rollers. It will soon be ready to go to the presses you see on another page.

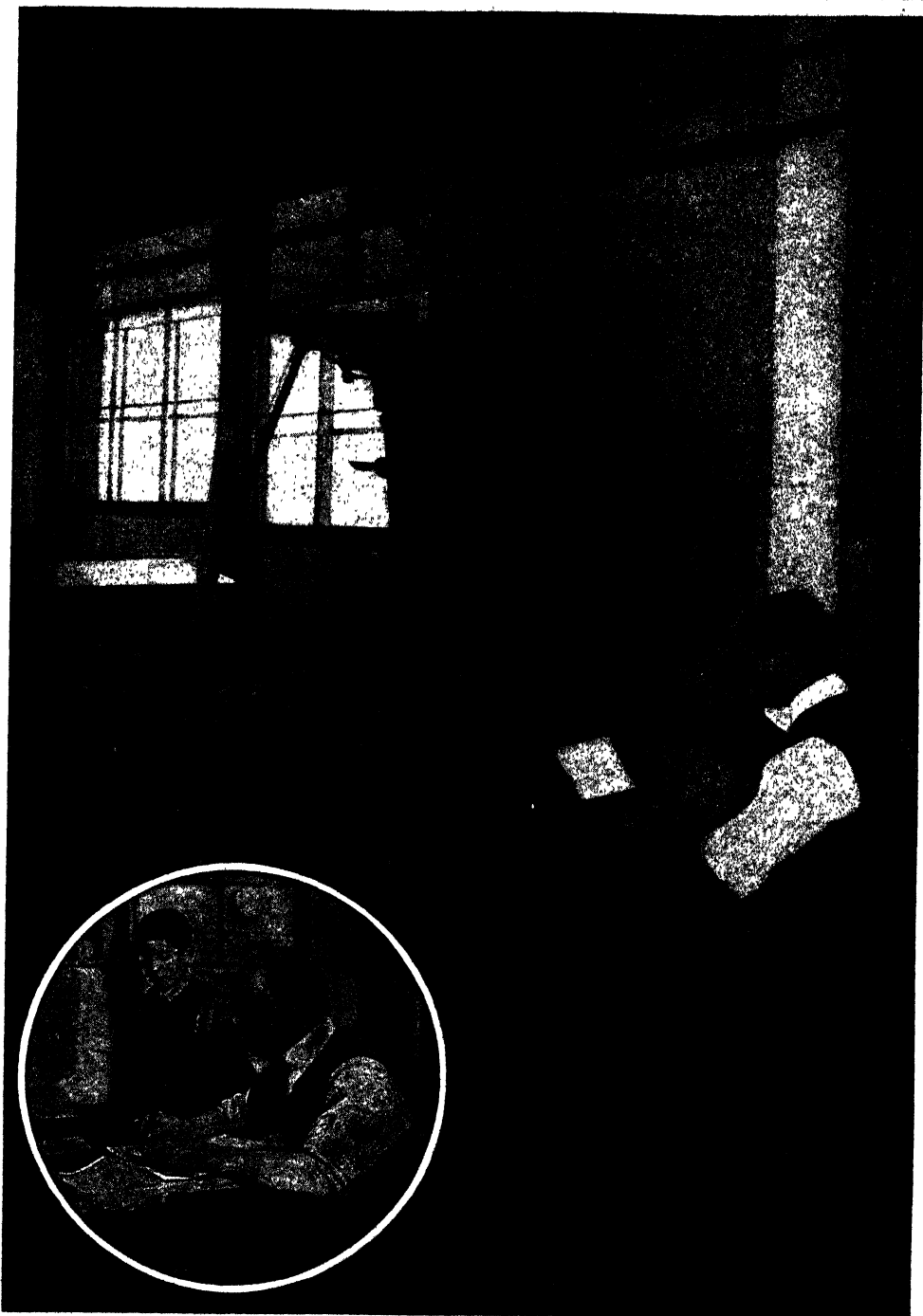


For many purposes paper is used in sheets instead of rolls. Here the rotary cutters are trimming the paper to the exact width desired and other knives will soon cut it into sheets.



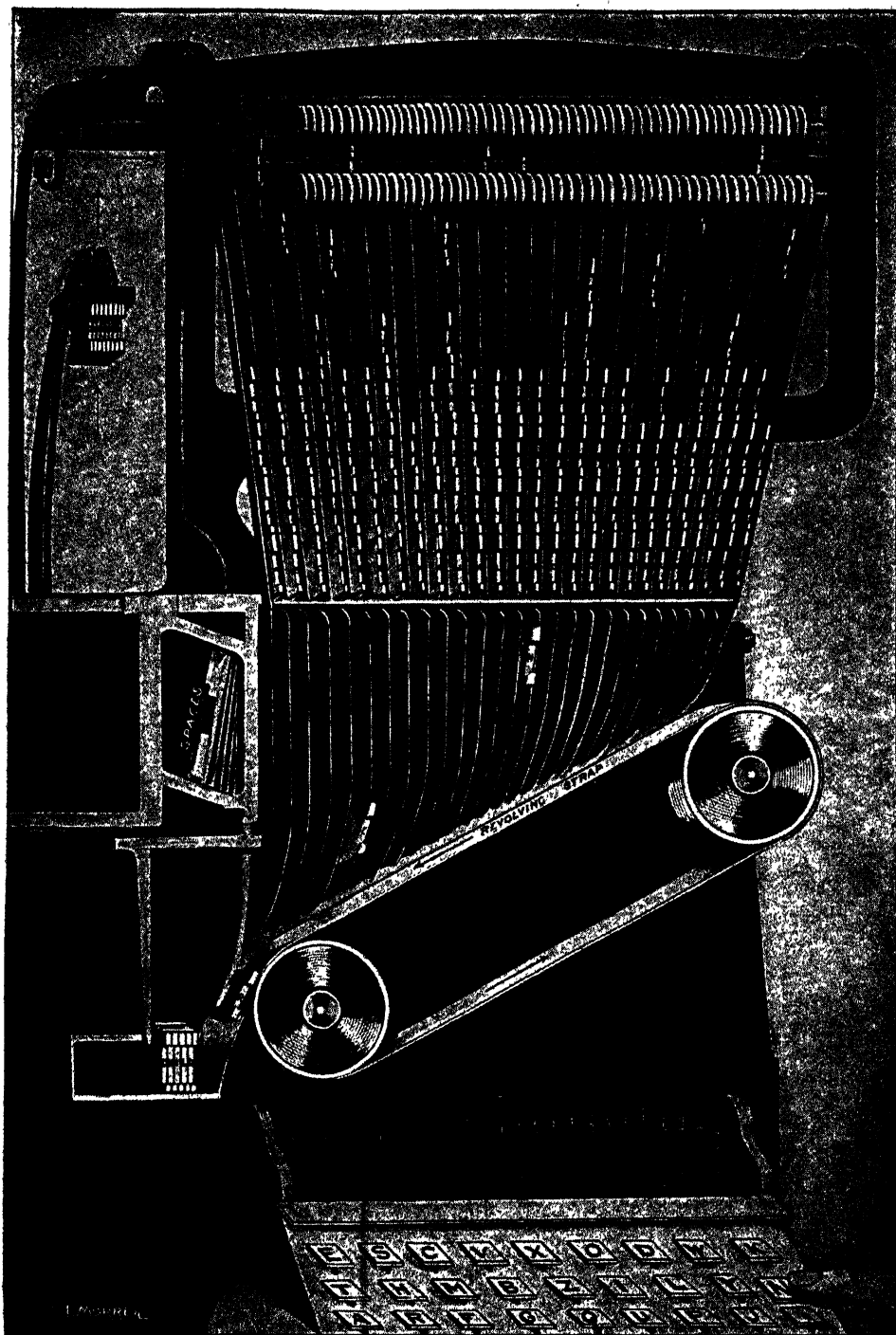
From this end of the cutting machines the rolls of paper appear in the large sheets which are used in printing this book.

THE BEGINNING OF THIS BOOK



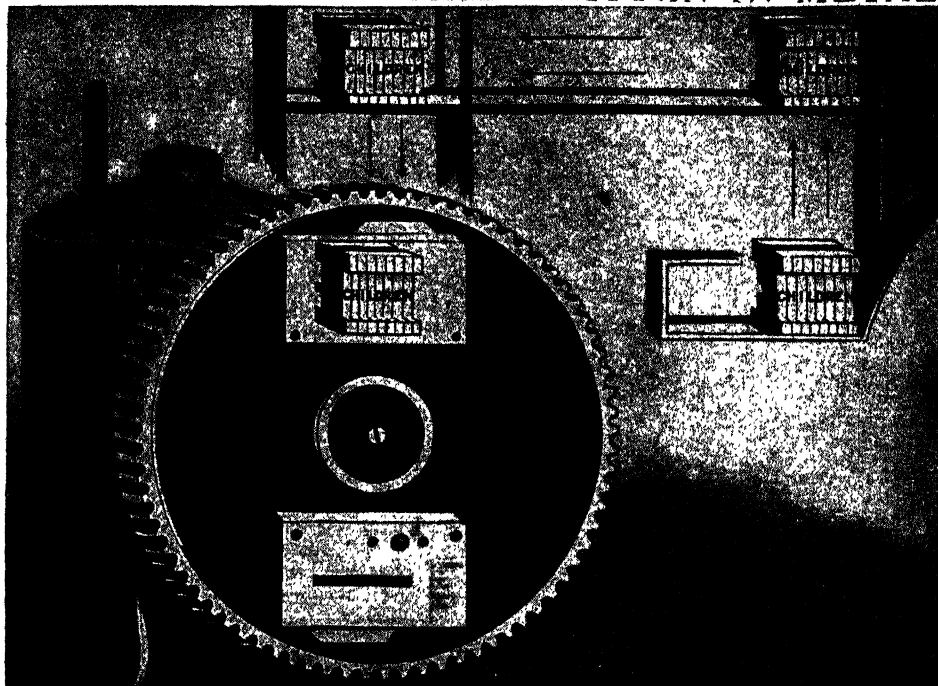
When the writer has set down his thoughts on paper, and the editor has prepared it for the printers, it is then passed on to be set up in type. In the small picture on this page the master-printer is marking the copy for the boy to take to the man at the machine. This machine is the most wonderful thing in printing. It almost thinks. By pressing down keys as we do at a typewriter, or a piano, the man at this machine sets the words in metal lines. Almost as fast as a man can think, this machine puts his thoughts in solid metal. The machine is called a Linotype, because it sets up lines of type. Pictures on other pages show how it works. The Linotype was invented by Ottmar Mergenthaler, but has been much improved.

THE MACHINE THAT ALMOST THINKS

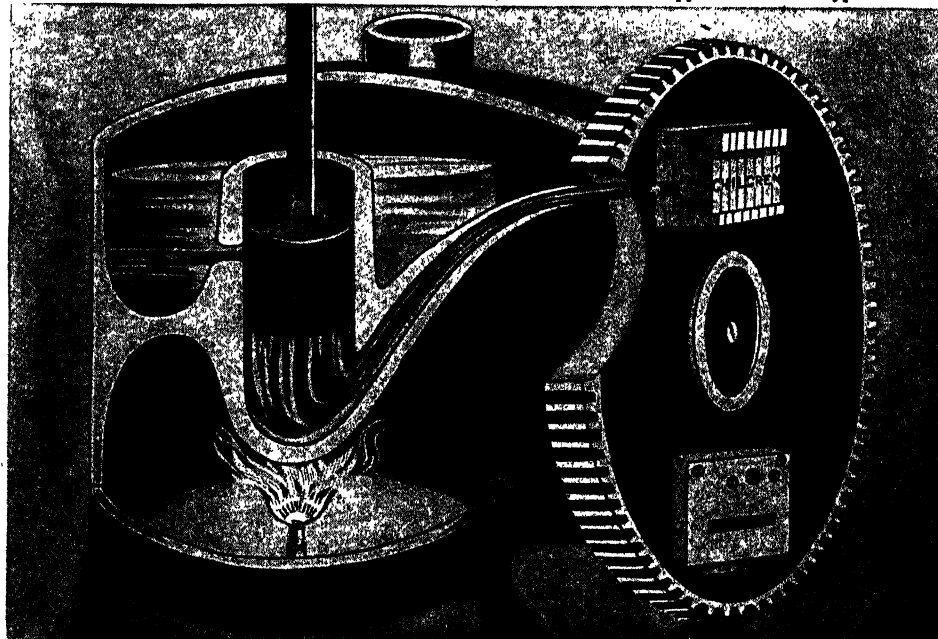


This is the front of the linotype machine with the cover off. In the long, narrow divisions at the top are curious little pieces of brass, which fall as the keys are touched. The man has just pressed down the N, and the brass piece with N on it is the last letter we see falling. The letters fall on to the revolving strap, and are carried into a little box above the keyboard on the left. In it you will see five little pieces of brass, with the letters CHILD. Coming down are the letters REN, so that we have the word CHILDREN. A wonderful thing happens to these letters in brass before they are carried back to their places by the arm on the left at the top.

HOW THE WORDS ARE WRITTEN IN METAL

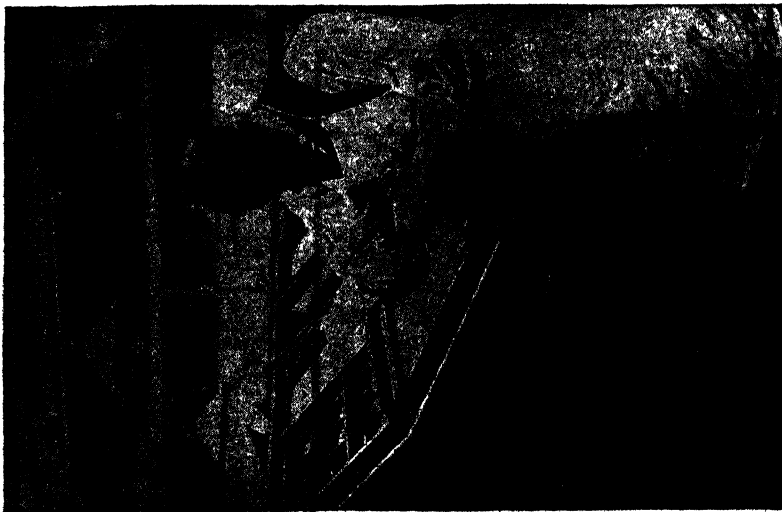


The brass letters are carried from their box until they rest against a slot in this wheel. There are two slots, to save time. The letters are cut into the brass—not raised up on it. They are cut in the brass as a boy cuts out his name on a tree. If boiling metal could be poured into the name cut on the tree, the metal would have the mark of the letters when it cooled down, and this is what happens on the linotype machine.



The letters are cut on both sides of the brass pieces, so that one line of letters is close to the slot. When this line of letters is ready, a heavy punch comes down into a copper of boiling metal behind the wheel, and forces the metal up a little passage into the slot where the brass letters are. This picture shows the copper as if it were cut in two, and the slot where the letters are formed is marked with a star. In a moment the metal rushes back into the copper, the wheel turns, bringing the empty slot into position, and the letters that are done with are carried along an iron band, from which they fall into their places ready for use again.

PREPARING THE STORY IN METAL FOR THE PRINTING PRESS



The story, which was first written on paper, is now in words of metal, and as the metal lines are ready they are put together so as to form columns like those in our book. The man at work here is putting the lines together.



Before the story can be printed the printers must be sure that there are no mistakes, so a proof is pulled by passing an ink roller over the type, and pressing a sheet of paper down upon it so that the type is printed on the paper.



The proofs are then taken to the readers. Every page must be corrected several times before it is printed, and the reader is supposed to be a man who neither makes mistakes himself nor lets other people's mistakes pass.

SETTING TYPE BY MONOTYPE MACHINE

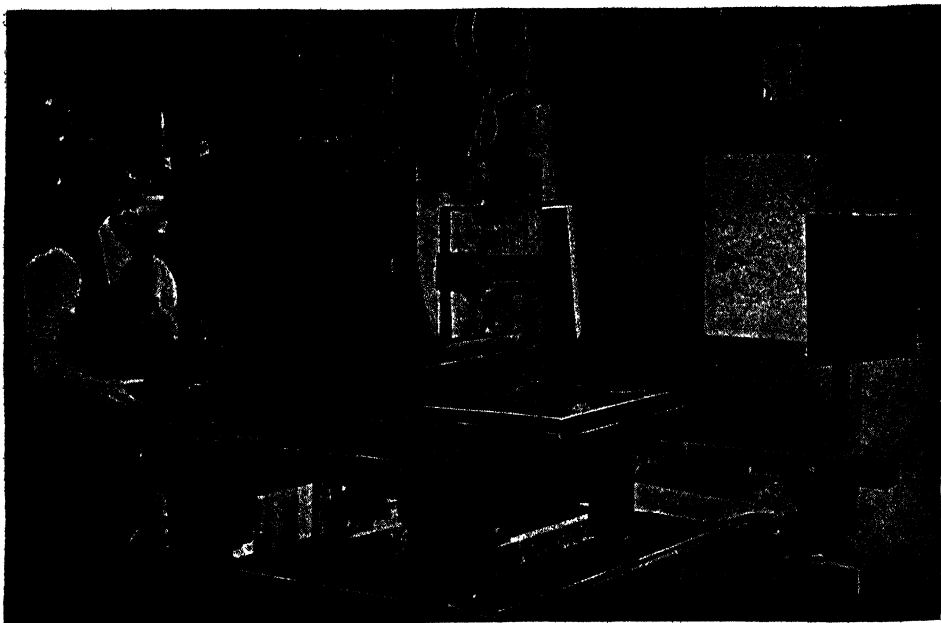


We have seen how the Linotype sets our books in solid lines. Here is another wonderful machine which sets in type single letters, as its name—Monotype—tells us. Instead of having all the work done by one person we now find two operators, one at the keyboard, and another at the casting-machine. The keyboards are very large, looking much like two or more typewriters all together. The keys actuate a punch, which makes holes in various positions on the paper ribbon which unwinds from a spool the end of which we can see at the top of the machine, and which then rewinds on a second spool. The upright cylinder in front will indicate when it is time to begin a new line. The pipe we see connecting the three keyboards in the front of the picture is for compressed air, which is used to operate the punch.

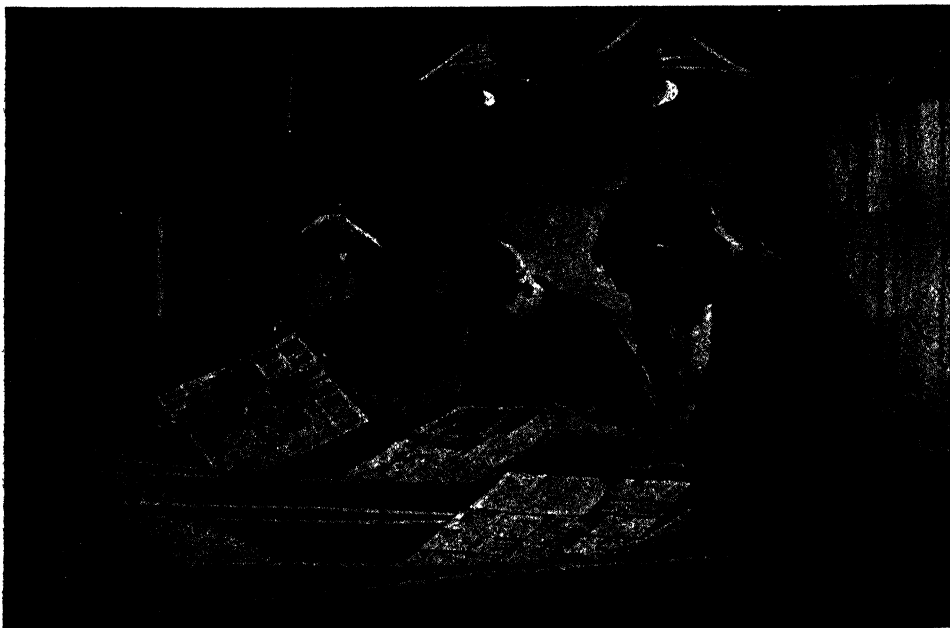


Somewhere within this heavy, compact piece of machinery is a little frame, perhaps four inches square, in which are fastened the Monotype matrices for our type. And now our paper ribbon is ready. Very odd it appears with its strange pattern of perforations, not at all suggestive to us of the interesting story hidden away in it. The operators, however, learn to read the perforated paper as they might a printed page. We cannot see it in this picture, but we know that all those little holes, by allowing just the right machinery to move, are going to guide the big machine so that, one after another, the right matrices will be brought into position to cast a letter. Soon we shall see a queer little finger pushing the newly-made type out on to the galley placed to receive it. The machine nearest us already has its galley partly filled.

MAKING PICTURES FOR THIS BOOK

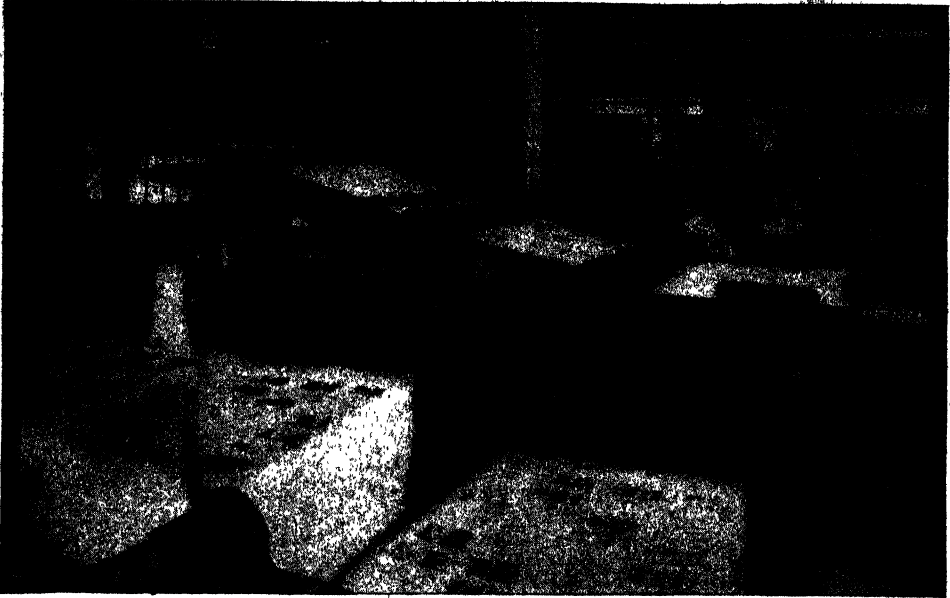


These pictures show us how the pictures come into **THE BOOK OF KNOWLEDGE**. When a photograph has been taken, or when an artist has drawn his picture, it is photographed by an enormous camera. The picture is on the right with a strong light shining on it, and is photographed direct on to a metal plate, just as the photographer takes your portrait on glass. But there is a very important difference between photographing for a book and taking a portrait. The large white square in front of the picture here is a fine screen, which breaks the picture up into extremely fine dots, so close together that they seem all one and do not spoil the picture. You can see them if you look at this picture with a strong magnifying glass.

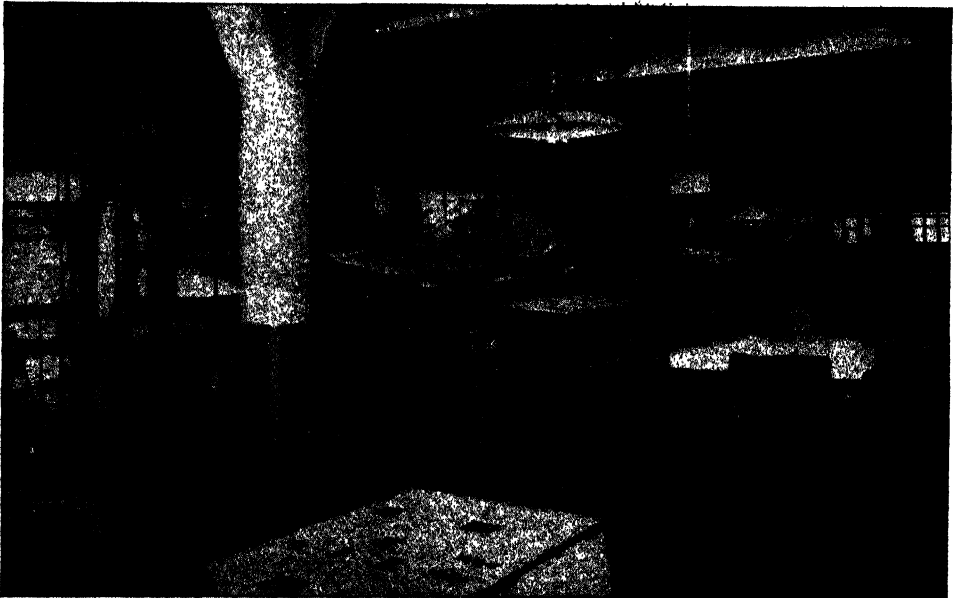


These little dots are of the highest importance; without them we could have no pictures like this in our book, because if the ink were pressed on to a smooth surface it would become a blur. The dots give the ink something to "catch hold of," and the ink will only print where there are dots. The metal plate is inked over and placed in a moving bath of acid, which eats away the metal where there is no ink. The ink protects the dots so that the acid cannot affect them, but the acid wears down what is not inked, leaving the picture made up of dots. This is then fixed to the metal plate. Some pictures, like those on p. 991, which are made without a screen, are made with the plate, but pictures like this must be made separately and fixed on.

THE MACHINES THAT PRINT THIS BOOK

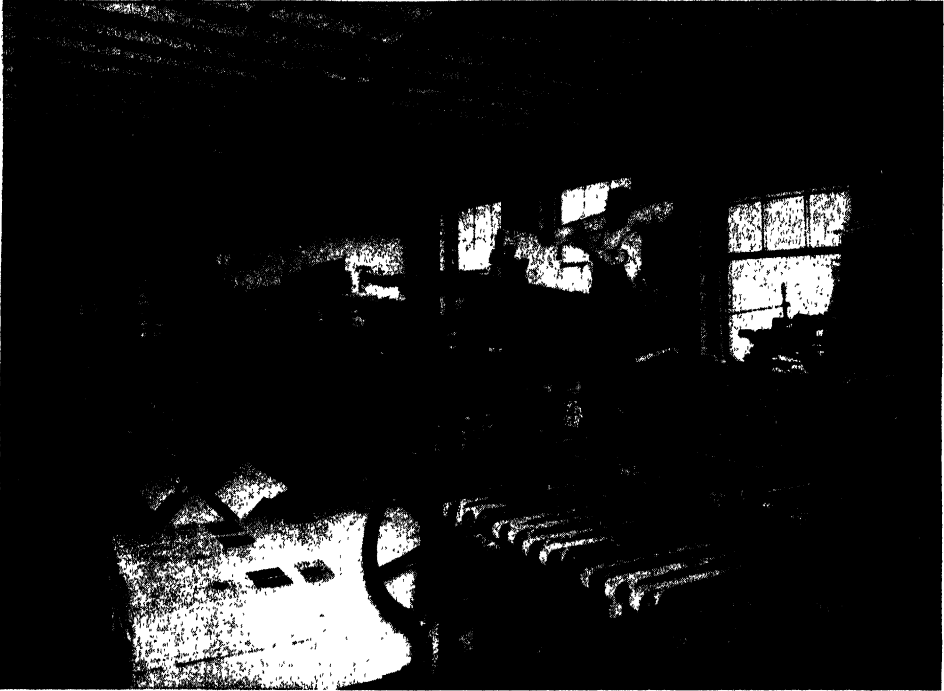


The plates are now ready for the printer and have been fixed in their place on the printing-press. Before the big machine can be set in motion, however, many hours must be spent in preparation. The profuse illustrations of our book make it necessary to exercise great care in this work. At length everything is made ready, and the electric current is turned on. High up at the left, above the pile of blank paper, the metal fingers of the automatic feeder push forward, rise, and draw back, to repeat the movement in tireless succession. One by one, but closely following one another, the sheets slip down, to make their journey to the other end of the press, being carefully inspected as they pass along, and recorded by the counting-machine. At our left are piles of the large sixty-four-page sheets already printed.



Here is a picture of another machine at work. We may the better appreciate its great size in observing how nearly it conceals from our view the man standing beyond it. The man at the press is on a platform running along its side. If the picture could show us the movement of the machinery, we should see the plates being carried to and fro below the cylinder and the great array of well inked rollers, and leaving their impression upon a sheet of paper being carried around the cylinder, each time they pass beneath it. These machines print much more rapidly than the old hand-presses, which once seemed so marvellous. Nevertheless, many of them are needed to keep ahead of the apparently endless procession of boxes of paper coming from the paper mill. An edition of the Book of Knowledge weighs many tons.

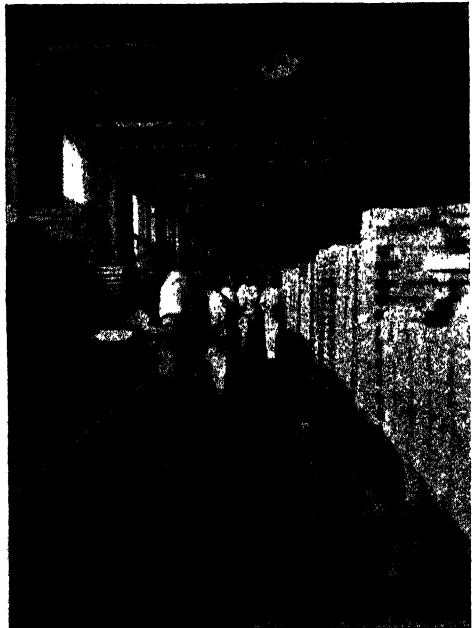
BOOK BINDING



The sheets of our book, as they come from the printing-presses, are flat. This machine takes these flat sheets, saws them into strips of sixteen pages each, and delivers them accurately folded, ready to go to the stitchers for sewing. This great machine does all the work so quickly and correctly that it almost seems as if the mass of metal knows what it is doing.



The sections of the book are here being stitched into place on a marvelous machine which does more perfect work than is possible by hand. Perhaps you can recognize the picture on the machine.



These men are engaged in rounding the backs of the stitched and trimmed volumes, and preparing them to receive their covers of cloth or leather. Thousands of volumes of our book are shown here.

THE NEXT STORY OF FAMILIAR THINGS IS ON PAGE 1087.

The Story of THE EARTH.

WHAT THIS STORY TELLS US

WE know that the whole earth is made of the same kind of stuff, and in these pages we begin a brief study of this stuff, which we call matter. The Greeks, who were at the time of their power the cleverest people who had ever lived, believed that the earth was made of four things—the ground, air, fire, water. These things the Greeks called elements, meaning that the things could not be changed or split up into anything else, but that they were the very foundations of the world. We know now that they were wrong, and that these things are not elements at all, but only mixtures of elements. We now come to read of the real elements, and we begin with the elements that make up the air.

AIR, FIRE, AND WATER

THE Greeks, when they spoke of the earth, probably meant all solid matter. Of course, they knew as well as we do that this solid matter composing the earth under our feet shows itself in many forms, such as gold and silver and iron and sand. But still, all these have a certain resemblance; they all look much more like each other than like such a very different thing as air; and so they were all grouped together under the one heading of "earth."

Of course, there are living creatures on the earth, such, for instance, as trees, and trees make the stuff called wood, which is different in many ways from the earth we pick up in the garden. But the Greeks recognized, quite rightly, that all living things are made out of the substance of the earth; that the earth is their *mother*, as they said. And so they still continued to include all solid things, not excepting the bodies of living creatures, as made of the one element *earth*. We now know, however, that the solid ground under our feet, and the living creatures which grow from it, are made up of many different elements, which no power, no kind of treatment, however long continued, will change into each other or will split up into different things, and we know that these are the real elements.

Now let us consider the next thing that the Greeks called an element—the air. We have already learnt that it is real matter, though we cannot see it; but is it really an element, as

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the Greeks thought—that is to say, is it made of only one thing, which is one and the same everywhere, and which, whatever is done to it, cannot be changed into anything else or split up into simpler things?

We can answer this question quite positively, for there is scarcely anything that chemists have more carefully studied than the air. *It is not an element, but a simple mixture of a number of elements* which can be sorted out of it, just as you might mix gold and silver by melting them together, and then might separate them from each other afterwards. The air is a mixture of different elements in the gaseous state. Now, I want you particularly to notice the word *mixture*, because it has an exact meaning, and because, when we come to say what we must say about water, we shall find that though water is also not an element, and though it contains two elements, yet *it is not a mixture* of those two elements, but is something else.

The case of water, and thousands of other things, is rather more difficult, and that is why I have purposely taken the air first, because scarcely anything could be more simple than air. The most simple kind of stuff, of course, is one that is simply made of one element, such as gold, or silver, or iron. Nothing could be more straightforward than that. But, after all, the case of the air is not much more difficult, for anyone who has ever added milk to tea, or seen a plum-pudding, knows what a mixture is.

If you take some powdered sugar and a little ground rice, and mix them together, there you have a simple mixture. Now, there is a particular fact about this mixture which must never be forgotten, and I specially do not want you to be careless and to think that you need not attend, because, when we come to the case of water, we shall see the reason why I am going into this question of mixtures now.

WHAT HAPPENS WHEN TWO THINGS MAKE ANOTHER QUITE DIFFERENT

The point about the mixture of sugar and ground rice is this: that, however perfectly they are mixed, the sugar remains sugar and the rice remains rice. *They are mixed, but they are not changed.* After all, it is no more than if you had one grain of rice and one grain of sugar, and put them side by side. The grain of rice is still a grain of rice, and the grain of sugar is still a grain of sugar.

That may seem simple, but it is of great importance that we should understand it, because, as we shall see, two elements can be made, in certain circumstances, to unite in a special way which is very much more than mixture, and to produce something which is absolutely different from either of them, just as much as if when you mixed sugar and ground rice they both disappeared, and you found yourself with a lot of water in the cup instead. That would be more than a mixture, would it not? Something must have happened very different from simply pouring two things out of two bags into one cup, and that is all you need do to make a mixture.

WHAT A MIXTURE IS AND WHAT A MIXTURE IS NOT

Now, the air is simply a mixture of elements. It is as if you took a quantity of one element in the form of a gas, made of tiny little specks called atoms—which we shall talk about soon—something like the grains of sugar or rice, and then to that you added a quantity of another element in the form of a gas, so that the tiny grains or atoms of which it was made just mixed with the atoms of the first element. It is as if you had black marbles in one pocket and white marbles in another, and you took them out and put them into a different pocket together. The black marbles would still be black, and the white marbles white, and you would

simply have a mixture of black marbles and white marbles.

Now, this simple fact, that the air is just a mixture of gases, took men an exceedingly long time to find out, and it took them still longer to believe; and even now, though people know that there are different kinds of stuff in the air, they are very often slow to understand that these kinds of stuff are simply mixed, and nothing more. And even in careless books, sometimes, you will find the facts wrongly stated, so as to suggest that the air is not merely a mixture of gases, but something quite different, which we may as well know the name of now; it is called a *compound*. But that is not so; the air is not a compound. If the air were a compound, none of us could breathe it, and so we should not be here to have any opinions about it, right or wrong. Fortunately, it is only a mixture, and the particular element which the air contains, and which we require, can be readily obtained by us without any difficulty.

THE TWO GASES THAT MAKE UP THE AIR WE BREATHE

This same element is found in water; indeed, as we shall see, water is very largely made of it, and could not be water without it. But if we had to get this element, which is called oxygen, from water, we should die at once, for water is a compound, not a mixture; and if you want to get an element out of a compound, you will have to do very special things and take great trouble.

There are two elements which make up nearly the whole of the air; their names are *oxygen* and *nitrogen*, and they are not really *combined*, but *mixed*, like the marbles in your pocket. Oxygen and nitrogen can be combined in various ways, but in these cases they make something quite different—which is, not oxygen, not nitrogen, and certainly not air. The best-known thing which is made out of oxygen and nitrogen when they are combined is called laughing-gas, which the dentist gives you so that you shall feel no pain when you have a tooth drawn.

I name the oxygen first, though the air is not an equal mixture of these two elements, and though, indeed, there is far more nitrogen than oxygen in it; but the oxygen is far more important,

though there is less of it. Just about one-fifth of all the air consists of oxygen, and just about four-fifths consists of nitrogen. Of course, these are only rough proportions, because, as a matter of fact, there is a tiny quantity of many other elements in the air helping to make up the mixture.

THE LAZY ELEMENT THAT KEEPS BY ITSELF, EVEN IN A CROWD

But though these elements are very interesting, yet they do not do anything in particular, and so they do not matter much to us. I will only tell you that one of them—perhaps the best known—is called *argon*, which means *lazy*, because, though, of course, it will *mix* with anything, it has never yet been made to *combine* with anything, but always keeps by itself, so to say, even when it is in a crowd. That is why it is called lazy.

But before we leave the air, I must just tell you a word or two about the nitrogen and oxygen in it. Though about four-fifths of the entire air is made of nitrogen, yet this element, as it exists in the air, is not very important in itself, for it does practically nothing. Very different is the nitrogen that exists in the earth, where it is also found, for in the earth it helps to build up the bodies of animals and plants, and without it there could be no life.

But practically all that the nitrogen in the air does is merely to dilute or weaken the oxygen, just as you dilute strong medicine by adding a lot of water to it. If all the air, instead of only one-fifth part of it, were made of oxygen, we should scarcely know ourselves.

WE COULD NOT LIVE WITHOUT OXYGEN, NOR COULD WE LIVE WITH TOO MUCH

Oxygen, as we have learned in the BOOK OF OUR OWN LIFE, beginning on page 67, is the element which all animals and plants breathe in order to keep alive. Without oxygen they would all die at once. And this is true even of the fishes of the sea, which breathe oxygen from the air that has got melted or dissolved in the water. This is quite different, as we shall see, from the oxygen that goes to *make* the water, which the fishes cannot use. If all the air were made of oxygen we should get too much of it into our blood, and we

should be probably very excited, and never rest, and live too fast. We should do what a fire does if you blow pure oxygen into it. It burns up like fury. It is quite easy to sift the oxygen out of the air, and collect it, and when men want an intensely hot flame they make something burn with this pure oxygen instead of with ordinary air. Also, sometimes when people are ill, and cannot get enough oxygen from the ordinary air, they are given pure oxygen instead to breathe for a time, and this often helps them greatly.

Well, that is all we need read about air at present. It is mainly a mixture of two elements in the form of gases, but it is an unequal mixture, about four-fifths of it consisting of the element nitrogen, and about one-fifth of the element oxygen. There are also tiny quantities of various other elements which go to make it up.

Now, what about the third thing which the Greeks thought was an element—namely, fire? This was rather a curious kind of mistake altogether, but perhaps if I boldly say that fire is not anything at all, neither an element, nor a mixture of elements, nor a compound, you will think I am talking nonsense.

FIRE IS NOT REALLY ANYTHING AT ALL, BUT ONLY A GLOW

But go and look at a fire and consider. There is the coal, some of it red hot, and there are the flames. Well, red-hot coal is simply coal in a particular state. Almost anything will glow if it is made hot enough. For instance, in the ordinary kind of electric light that we have in houses, the little thread inside glows, but that is simply because the electricity running through it makes it hot. The thread is not burning; indeed, there is no air inside the globe for it to burn with. It simply glows because it is hot.

Then, again, there are the flames of a fire, and the Greeks were enormously interested in flames, because they thought that flames must be alive, owing to the way they move and jump. But a flame is really nothing else than a glowing burning gas. The gases in a flame are, of course, made of elements; they are matter, like the air or a gold coin; but the flame itself is not a new and special kind of element, it is only what these elements look like when they are burning

and glowing. So, plainly, in our list of the elements we cannot count fire at all.

And now we come to the fourth of the things which the Greeks thought were elements, and that is *water*. This is, of course, one of the most wonderful, interesting, and important things in the world, though it is so common. I know we are apt to think that when a thing is common it cannot be wonderful. We fancy that the only things really wonderful are those that are very rare.

THE GREAT WONDER THAT LIES IN COMMON THINGS EVERYWHERE

But the man who thinks only rare things wonderful is stupid. One of the greatest men who ever lived, a man to whom every human being owes much for his wonderful discoveries, the Frenchman, Pasteur—for whose sake the whole world is indebted to France, and whose name ought to prevent us from talking nonsense about Frenchmen—said that “everything is wonderful”; only, of course, he said it in French, *Tout est miracle*. The greatest men who have ever lived and the men who have done the greatest deeds are the men who have seen the wonder in common things. The great English poet Wordsworth, who was writing just a century ago, and who made a revolution in poetry, so that all English poetry since him has been a different thing, was great because he never lost the power of seeing the wonderful in everything. Children have this power, and they keep it until they go out into the hard world, or until they meet people who tell them not to ask questions. Here we may give a moment to two quotations from Wordsworth, and when we come to study the wonderful common thing called water, let us remember them.

THE WONDER OF WATER, OF WHICH MOST LIVING THINGS ARE LARGELY MADE

Writing of a man, Wordsworth said :

A primrose by the river's brim
A yellow primrose was to him,
And it was nothing more.

And at the end of what is, perhaps, his greatest poem, in which he tells us how, as a child, he felt the future within him, he says :

To me the meanest flower that blows can
give
Thoughts that do often lie too deep for
tears.

We have to learn that there is nothing common or unclean, and that even ordinary water, though it is one of the commonest things, is also one of the most wonderful things in the world. It is to be found everywhere. There is a vast quantity of it in the air in the form of a gas or water-vapor; enormous quantities of it occur in the form of ice in the neighborhood of the two Poles of the earth—the North Pole and the South Pole. In its liquid form it covers three-fifths of the entire surface of the globe. Fully three-fourths of the entire substance of our own bodies consists of it, and this is practically true of all living creatures.

There could be no life without water. Most of the changes that occur on the surface of the earth are due to the action of water. There are very few forms of matter, indeed, which will not melt or dissolve in water to some extent; and this applies not only to solid things like sugar, and to liquid things, but also to gases.

WATER IS MADE UP OF SIMPLER THINGS THAT ARE NOT WATER

One of the most important questions about the planet Mars is as to the presence of water there; and one of the most important facts about the moon—a fact which explains why the moon is lifeless, and why scarcely anything ever happens on its surface—is that there is no water on it.

For many ages men believed that water was an element. There was no reason to believe that water could ever be split up into anything simpler. But we now know that water is not an element, and few more important discoveries have ever been made than this.

The truth is that water is made up of simpler things which are not water. Now, the first thing that will occur to you is perhaps that water, like the air, is a mixture. Obviously, it is not a mixture of gases, for a mere mixture of gases would itself be gaseous, as the air is; but perhaps it is a mixture of liquid things, just as milk is. But this is not so. *Water is neither an element nor a mixture*, but is what is called a *compound*, and as most of the things of which the earth is made are compounds, we must be sure we understand what this means before we go any further.

THE NEXT STORY OF THE EARTH BEGINS ON 1031

The Book of THE UNITED STATES

WHAT THIS STORY TELLS US

YOU boys and girls who live in the United States to-day will probably think the life of the children of two hundred years ago a very hard and dull affair. But though our colonial ancestors in their childhood days had fewer toys, fewer privileges and less freedom than the boys and girls of to-day, it is not at all certain that they were less happy. In this article we will learn of the sharp discipline administered to naughty children by stern schoolmasters and not less stern parents; we will hear how the tithing man rapped their heads when they were restless in church and indignantly tickled their noses when they fell asleep during the four-hour sermon; we shall see the children in the school and at home, in the village meeting house and at their sports in different parts of the country.

CHILD LIFE IN COLONIAL DAYS

HAVE you ever thought how much is done for children in these days? The school is often the most costly building in the town; thousands of books are printed for them, toys are made by the million, and amusements of every kind are provided for them. This was not the case when our country was young. Then children were "expected to be seen and not heard," and they were expected also to obey without any question.

There is no doubt but that parents loved their children then as much as they do now, but they were afraid of spoiling them by too much indulgence. In the earliest days of the colonies life was hard for every one, and children had to do without things as well as every one else. Yet we know that these children were not unhappy, and we find that not all of them were good in spite of the severe punishments. Let us see how these children lived and how their life differed from that of their descendants in our country to-day.

SNORRO AND VIRGINIA DARE, THE FIRST WHITE CHILDREN

So far as we know the first child born in America was the little Norseman, Snorro, who was born about 1007, as we learned in another story. He went back to Europe when three

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years old, however, and so hardly counts as an American child. There were doubtless Spanish children born at St. Augustine, which is the oldest town in the United States, but the next child of whom we shall speak was the first English little one born in our country. This was little Virginia Dare, born in 1587, on Roanoke Island, now a part of North Carolina. Sir Walter Raleigh was trying very hard to found a colony in this region, which he called Virginia, in honor of Queen Elizabeth, the Virgin Queen, and the little girl was named for the country. Before little Virginia was three years old the colony disappeared, and no one knows to this day what became of it. We shall tell in another place all that is known of the "Lost Colony of Roanoke."

CHILDREN BORN ON THE MAYFLOWER

Years after this a small ship called the Mayflower was crossing a cold and wintry sea with a little band of Englishmen seeking homes in the new land. Two new baby boys had been added to their number, and almost every one on board ship was crowding into the dark little cabin, anxious to help the parents to choose names for the tiny fellows. It was at last decided that they should be called Oceanus and Peregrine. The first

name is the Latin for ocean, and the second means wanderer. The names seemed to fit, as the children had been born on the ship near the close of the wanderings of the Pilgrims.

"Oceanus! Peregrine! What very odd names for children!" you exclaim. Yes, indeed, and very odd names many of the children were given who were born in New England in the days of long ago. Parents chose names from the Bible, or else gave the names of the Christian virtues to their children. Some showed the conditions under which the little ones had come into the world. Large families were the rule in those days, sometimes as many as ten or fifteen children. Many of them bore such names as Deliverance, Temperance, Hope, Patience, Truth, Faith, Isaiah, Jeremiah, Preserved and so on.

HARDSHIPS OF THE COLONIAL CHILD

But if the names were strange the manner of their bestowal seems far more so. "Half the Puritan children had scarce drawn breath in this vale of tears ere they had to endure an ordeal which might well have given rise to the expression, 'the survival of the fittest.' All were baptized within a few days of birth, and baptized in the meeting house. We can imagine the January babe carried through the narrow streets or lanes to the freezing meeting house which had grown damper and deadlier with every wintry blast; to be christened, when sometimes the ice had to be broken in the christening bowl. It was a cold and disheartening reception these children had in the Puritan church; many lingered but a short time there. Indeed from the moment when the baby opened his eyes on the bleak world around him, he had a Spartan struggle for his life." Those that survived were usually very hardy. As soon as a child was two or three years old his small shivering feet were daily dipped into a tub of icy cold water to make them tough. Many parents for the same reason believed that their boys should wear shoes "thin enough that they may leak and let in ye water."

SCHOOLS AND SCHOOLDAYS IN THE COLONIES

At first in most of the colonies there was little regular education of the children. The boys learned at home how to read and write and the girls to sew,

but there were no schools; the men were too busy making homes and providing food for their families to think of the matter. But in the hearts of our forefathers was a deep-seated reverence for education and presently people began to build schoolhouses. Then here and there, wherever there were towns, schools were started. In Massachusetts every town of fifty families was compelled by law to keep a school for boys, but nothing was said about girls. The buildings sometimes were small, uncomfortable log cabins; the books were few and tiresome, and the schoolmasters were often not good teachers. Yet nothing could weaken the ambition of the parents to have their children educated. "Child," said one noble New England mother of long ago, "if God make thee a good Christian and a good scholar, 'tis all thy mother ever asked for thee."

So the children, whether they wished it or not, were packed off bright and early each morning to the schoolhouse, with their spellers or their arithmetics tucked under their arms. The rules for one school in New England required school to begin at seven o'clock in summer and at eight in winter. The older boys and girls sat at rude desks made of boards, resting on pegs driven into the floor, which was sometimes of earth. The younger scholars sat on blocks or benches of logs. Few of the seats had backs.

SOME TEACHERS AND HOW THEY LOOKED

Usually the boys and girls began in a school kept by a woman in her own home. This was called a "dame school." Then the boys were transferred to a school kept by a man, for at first little attention was paid to the education of girls beyond reading and writing. In New England the ministers were often teachers as well. The same was true of some parts of the South. These ministers were usually college graduates, who taught Latin and Greek well, and were much respected. In other colonies the position of the teacher was lower. Once in New York, the town council advertised for a man to act as clerk, serve as sexton of the church, ring the bell, dig graves, lead the singing in church, and teach the children. Sometimes the teacher was a man who had failed at everything else he had tried. Often,

however, he had a very good opinion of himself.

The appearance of one of the schoolmasters of "ye olden days" is thus described: "He wore a tabby velvet coat, the tails of which stood sometimes straight out. Inside the coat was a waistcoat of tremendous length, through which showed conspicuously the nicely starched ruffles of his white shirt. His knee breeches of velvet like his coat, were finished at the knee by large and shining silver buckles. With these in lustre, vied two more silver buckles which rested on the top of his clumsy shoes. Around his neck was wound, just once and a half, a stiffly ironed stock, which helped to keep his head stiff and straight as became a teacher in his day. But above all, his crowning glory was his wig, the white powdered wig, combed straight back from his forehead, and hanging always in a nicely braided queue behind." The custom of wearing the hair in a queue lasted until after the Revolution.

HOW THE CHILDREN THEMSELVES WERE DRESSED

To modern boys and girls the children's clothes would seem every bit as odd as those of the schoolmaster. The girls were arrayed in stiff homespun linsey-woolsey petticoats and bodices. Linsey-woolsey was a rough cloth, half linen and half wool. About their throats they wore white kerchiefs and at their wrists white cuffs. The Puritan maidens wore demure little caps such as you can see in any picture of the Pilgrim mothers. The boys wore knee breeches, long waistcoats and heavy coats with wide pockets and wide turn-over cuffs. The children of well-to-do parents who were not Puritans, frequently wore ruffles of fancy white linen at their necks and wrists.

Sometimes boys were sent away from home to a relative who lived near the school and providing a suitable wardrobe was a difficult problem. One old lady who was boarding her grandson during the school term wrote home to his father in deep distress. "Richard wears out nigh twelve paires of shoes a year. He brought twelve hankers with him and they have all been lost long ago; and I have bought him three or four at a time. His way is to tie knottys at one end and beat ye boys with them & then to lose them & he cares not a bit what I will say to him."

THE SCHOOROOMS AND THE LESSONS

School opened with prayer, after which the children began their reading, writing, spelling, or arithmetic lessons as the case might be. Paper was scarce and high, and lead plummets were used instead of pencils. The children did their problems or copied their writing into note books made of foolscap paper sewed into book shape and carefully ruled by hand. "Among the thrifty Scotch-Irish settlers in New Hampshire and the planters in Maine, sets of arithmetic rules were copied by each child on birch bark."

At eleven o'clock the bell rang for recess and the children, delighted to stretch their legs and shouting to each other as they ran, scampered off home, not to return until one o'clock. Those who lived too far away brought their dinner, just as some children do in the country now. The afternoon session lasted until four, or five, and school closed as it had opened with prayer. On Wednesdays and Saturdays they learned and recited the catechism, or the prayers from the prayer book, in some colonies.

METHODS OF DISCIPLINE IN THE OLD-TIME SCHOOLS

"Spare the Rod and Spoil the Child," was the motto of every parent and every teacher. The discipline in the school was very severe. Boys who did not learn their lessons or were impertinent to their master were soundly flogged and, as this happened not infrequently, the schoolroom continually resounded with the swish of the birch rod. Often, too, our stern great-grandfathers whipped their sons because they had been whipped at school. Children were taught to obey their parents according to the commandment, without arguing and objecting. An early law of Connecticut fixed the penalty of death upon any son who should strike his parent.

In the "dame schools," as the schools kept for little folks by a woman were called, some of the methods of punishment were quite novel. The schoolmistress would go about among the benches and briskly tap the heads of idle children with a heavy thimble she always wore on her finger. Lying was punished by applying hot mustard to the tongue of the offender; whispering met the unpleasant fate of being gagged with a small wooden board; stupid chil-

dren were made to stand upon a tall "dunce" stool, and any child who was so wicked as to be guilty of stealing had his small fingers burned with red hot coals.

REWARDS AND PUNISHMENTS IN THE OLD SCHOOLS

Among other modes of punishment were strapping tender hands with leather thongs with holes in the middle, and pinching the ear lobes and noses of naughty children with pieces of wood, shaped like clothes-pins. In some of the schools, good and industrious children sometimes received such rewards of merit as a portion of a strawberry divided among three or four pupils, or had a red, pink or blue bow tied to their shoulders to wear home to show their proud parents. In schools where these were used a black bow was pinned upon a naughty child, with the usual consequence of a whipping administered at home.

A writer of 1750 says, in commenting on his schooldays:—"When I was three years old, I was sent to school to a mistress, where I learned to read with neat dispatch; in my fifth year, I was taken away and put to a writing master. In my seventh year, I flourished a tolerable hand and began my grammar. By the time I was fourteen I was considerably proficient in the Latin and Greek languages and was admitted into Harvard." Perhaps it was owing to the early age that our ancestors were sent to school, and the fact that they entered college while mere boys that corporal punishment was in vogue in the higher educational institutions.

COLLEGE STUDENTS WERE SOMETIMES WHIPPED

Students at college were often publicly thrashed. Among the rules of Harvard College published in 1660 was this:—

"It is hereby ordered the president and fellows of Harvard College have the power to punish all misdeeds of the young men of their college. They are to use their best judgment and punish by fines or whipping in the hall publicly, as the nature of the offence shall call for."

That such punishment was not always wholly undeserved is shown by the following grim comment upon misdemeanors of students in that college:—

"M—, H— & W— were ex-

pelled from college and their names cut out of the tables in the dining-room by order of the president of the college; this was done before all the fellows interested. It was because of the disorder and bad actions of these three young men towards Andrew Belcher. They killed Grandma Sell's dog and stole ropes with which to hang him. They hung him upon a sign post at night, as one of them afterwards confessed before the college authorities and before his comrades. And at the time it was not denied in any way; but two of the students afterwards had the third one say that after all that what he had related was not true. Many great lies were told by all of them and especially by one. And there were many reasons for the belief that they committed these crimes."

TUTORS ON THE PLANTATIONS IN THE SOUTH

In the South there were few towns, and most of the people lived on farms or plantations, often at some distance from neighbors. Therefore it was common for planters to employ tutors for their children. These private tutors were often of a much higher grade of intelligence than the teachers at the ordinary schools, as they were usually college graduates or students. Often the owner of a Southern plantation would hire a tutor for his sons and daughters, and invite the parents on neighboring estates to send their children.

Here is an interesting extract from the diary of a young Princeton graduate who went down to Virginia to be the tutor of the children of the wealthy Carter family in 1773.

"Monday, November 1st. We began school. The school consists of eight. Two of Mr. Carter's sons, one nephew and five daughters. The eldest son is reading Sallust; grammatical exercises and Latin grammar. The second son is reading English grammar and reading English writing, and ciphering in subtraction. The nephew is reading and writing as above: and ciphering in reduction. The eldest daughter is reading the Spectator, writing, and beginning to cipher. The second is reading now out of the spelling-book, and beginning to write. The next is reading in the spelling-book. The fourth is spelling in the beginning of the spelling-book. And the last is beginning her letters.

A DAY ON A SOUTHERN PLANTATION

"In the morning so soon as it is light a boy knocks at my door to make a fire. After the fire is kindled, I rise, which now in the winter is commonly by seven or a little later. By the time I am drest the children commonly enter the school-room, which is under the room I sleep in. I hear them round one lesson, when the bell rings for eight o'clock (for Mr. Carter has a large good bell which may be heard for some miles, and this is always rung at meal times); the children then go out; and at half after eight the bell rings for breakfast, we then repair to the dining-room; after breakfast, which is generally about half after nine, we go into school, and sit till twelve when the bell rings, and they go out for noon; the dinner bell rings commonly about half after two, often at three, but never before two. After dinner is over, which in common, when we have no company, is about half after three, we go into school, and sit till the bell rings at five, when they separate till the next morning. We go into supper commonly about half after eight or at nine, and I usually go to bed between ten and eleven.

THE DANCING-MASTER MAKES A VISIT

"Saturday, December 18. After breakfast, we all retired into the dancing-room and after the scholars had their lesson singly round Mr. Christian, very politely, requested me to step a minuet; I excused myself, however, but signified my peculiar pleasure in the accuracy of their performance. There were several minuets danced with great ease and propriety; after which the whole company joined in the country dances; and it was indeed beautiful to admiration, to see such a number of young persons, set off by dress to the best advantage, moving easily to the sound of well performed music, and with perfect regularity, tho' apparently in the utmost disorder. The dance continued till two, we dined at half after three. Soon after dinner we repaired to the dancing-room, again. I observed in the course of the lessons, that Mr. Christian is punctual, and rigid in his discipline, so strict indeed that he struck two of the young misses for a fault in the course of their performance, even in the presence of the mother of

one of them. And he rebuked one of the young fellows so highly as to tell him he must alter his manner, which he had observed through the course of the dance to be insolent, and wanton, or else absent himself from the school."

The number of people who could afford tutors was small, and the children of the smaller farmers had poor opportunities of gaining an education. There were some good academies, but the children who went to school at all, for the most part, attended little neighborhood schools, which were badly taught.

CHILDREN'S WORK IN THE DAYS LONG AGO

But all children did not have an easy time. Except where the parents were wealthy, the children at a very early age were expected to do their share of the house and farm work. Captain John Smith wrote of fishing before there were many children in New England:—"He is a very idle boy who has passed the age of twelve years and cannot do as much; and a girl is very stupid who cannot spin a thread to make nets to catch the fish. What pleasure can be greater, when people are tired with work on shore, whether they have been planting vines, or building houses or ships, than to get recreation for themselves before their very doors, in their own boats upon the sea. There man, woman and child, each with a small hook and line, may take divers kinds of excellent fish at their pleasure. And is it not a pretty sport to pull up two-pence, six-pence, and twelve-pence as fast as you can haul and change a line? He is a very bad fisher who cannot take one day with his hook and line one, two or three hundred cods. These, dressed and dried, if they be sold here in New England will bring ten shillings for a hundred; or in England, more than twenty. If a man work but three days in seven he may get more than he can spend unless he is very wasteful."

EVERY HOUSE ALSO A SORT OF FACTORY

You must remember many of the things which we now buy in the shops were then made at home. The mother then spun the wool or flax into thread, and wove it into cloth and made the clothes for the family. She knit the stockings and even made hats. She pickled and preserved, dried fruit, and

even made the soap and candles for family use. In this she was of course helped by her daughters, who had their work given to them when very young.

The father was a farmer, and often carpenter, tanner, shoemaker and blacksmith as well. The boys had their work on the farm as soon as they were able to help. They took care of the animals, giving them water and food; chopped the wood for the great fireplaces, and tended the fires; brought in the corn and hay from the fields and put them away in the barn; and when they were old enough, ploughed the fields. Such a state of things always exists in a new country and in some parts of the United States has not entirely disappeared yet.

THE SABBATH IN OLD NEW ENGLAND

In New England the observance of Christmas Day was forbidden as "unseemly to ye spiritual welfare of ye community." William Bradford, governor of the colony of Plymouth, grimly commented upon the first Christmas.

"The day called Christmas Day, the governor called them out to work (as was used), but most of this new company excused themselves and said it went against their conscience to work on that day. So the governor told them that if they made it a matter of conscience he would spare them until they were better informed. So he led away the rest and left them; but when they came home at noon from their work, he found them in the street at play openly, some pitching the bar, and some at stool ball and such like sports. So he went to them and took away their implements and told them it was against his conscience that they should play and others work."

"But," you perhaps are thinking, "there was at least one day of the week in which the children could be free from the discipline of parents or schoolmaster"—and you remember the many pleasant Sunday afternoons of your own life. But Sunday for the boys and girls of New England was a day of restraint. The Puritans brought with them to this country a fixed idea that the first day of the week, the Sabbath, should be strictly observed. Even in Virginia and New York, where the people were not so strict, there were rigid laws for the ordering of one's conduct on the Sabbath Day. "In Massachusetts the law provided that no

person should be permitted to walk in the streets on Sunday, except in reverently going to church or returning from the services."

CHURCH SERVICES LASTING ALL DAY

Both at the North and at the South, it was the custom to have two or three religious services during a single Sunday, with a long recess at noon for luncheon. In New England and some of the other colonies there were little houses or shanties built near the meeting house, so that people might be kept warm and dry during dinner. These were called "noon houses." You can well imagine that the children did not always find Sunday a welcome day.

In the early history of our country it was thought wrong to have a fire in the churches on the Sabbath. A few delicate persons had footstools in which hot coals and ashes were placed, so that their feet might not freeze entirely, but all others were expected to endure the cold.

The Sabbath began in New England at sunset on Saturday afternoon, when all work was stopped and the children's play hushed, to prepare their minds for the coming of the Sabbath. Next morning the whole family arose early. No work, except such as was absolutely necessary, was done. No hot meals were prepared. The dishes were left unwashed until Monday morning. Whether the weather was stormy or fair, the entire household, save the tiniest children and some one to mind them, set out for the meeting house, sometimes several miles distant. In the earliest days, as they approached the meeting house through the woods, their Bibles under their arms, the men often carrying their guns, they could hear the muffled beat of a drum through the Sabbath hush. It was the call to prayer.

When they entered the church the children were separated from their parents, the boys going into one pew and the girls into another. The service was a long one, the sermon sometimes lasting three or four hours. Do you wonder that the boys got restless and the girls sleepy? But woe betide the unlucky child who chanced to close his eyes. All of a sudden down would come the tap, tap, of a knobby pole upon his head. It was the "tithing man," whose duty it was

to keep order during the church service. Now he tickled the face of a sleepy little girl with the fox-tail on the end of his pole, now he smartly rapped the skull of an unruly small boy.

HOW THE BOYS WERE KEPT IN ORDER IN CHURCH

That the boys were unruly is proven by the records of their time. One reads, thus:—"We of Medford do pass an order that all small boys who cut the seats in the meeting house shall be persecuted." Tithing men and constables were appointed especially to watch over the "pue of ye wretched boys" to "see that they behave comlie, and use such raps and blows as shall be meet." Another record reads:—"His majesty's Tithing man entered complaint against Jona and Susan Smith, that on the Lord's Day during Divine Service they did smile. They were found guilty and each was fined five shillings and costs."

In early days in New England the Sabbath ended at sunset on Sunday, twenty-four hours after it began. This custom grew out of the fact that the Jewish Sabbath, of which we read in the Bible, began at sunset. You know, of course, that the Jewish Sabbath begins at sunset on the day of the week which we call Friday.

There were Sabbaths when the snow was white and thick on the ground, and the air was crisp and clear that proved a "temptation of ye Devile" to many boyish hearts and they fell by the wayside and went "sleeing." This roused the deep wrath of the Albany authorities and they passed a law forbidding such "unseemly wickedness."

"Whereas the children of the said city do very unorderly, to the shame and scandal of their parents, ride down the hills in the streets of the said city with small and great sleds on the Lord's Day . . . now for preventing the same it is hereby published and declared it shall and may be lawful for any constable in this city to take any such sled or sleds from all and any such boys and girls riding or offering to ride down any hill within the said city and break any sled or sleds in pieces."

Moreover it was ordered that the officer seize the cloak or upper garment of the offenders and present them to the parents to be redeemed on the payment of a fine of five shillings.

MANY KINDS OF GAMES

The games played by the children were different in different sections of the country. But Puritan children were brought to look upon wholesome games and frolic as deadly sin. Football, especially dear to boyhood hearts, was pronounced a game "wherein is nothyng but beastlye furie and exstreme violence." As the years went on the people of New England grew more tolerant, and did not look so seriously upon childish play. During the fifty years before the Revolution the rules were not so strict. The Dutch settlers had many games. They were very fond of bowling on the grass. A well known little park in New York, Bowling Green, shows the popularity of the game, that was played there. They also played "tick-tack," a complicated sort of backgammon, and "trock," on a table somewhat like a billiard table, in which an ivory ball was struck under wire wickets with a cue. Coasting down hill became a popular sport. The sleds were low, with a rope in front, and were started and guided by a short stick. The children played with marbles, tops, hoops, kites, balls, even as do the boys and girls of to-day. Such familiar games as prisoner's base, hop-scotch, tag and leap frog were well known. Running about on stilts was a favorite diversion.

ANOTHER BIT OF THE YOUNG TUTOR'S DIARY

In the South, as in New York, good times were more common. Dancing was considered a very important thing to know. Our forefathers, however, knew nothing of round dances. The stately minuet, the quadrille, the Virginia Reel, and a number of "country dances" were among their favorites. The young tutor, a bit of whose diary we have already read, writes thus of Virginia days:—"Nothing is now to be heard of in conversation, but the balls, the fox-hunts, the fine entertainments, and the good fellowship, which are to be exhibited at the approaching Christmas. Mr. Goodlet was barred out of his school last Monday by his scholars, for Christmas holidays, which are to continue till twelfth-day; but my scholars are of a more quiet nature, and have consented to have four or five days now, and to have their full holiday in May next.

"When the candles were lighted, we

all repaired into the dancing-room; first each couple danced a minuet; then all joined as before in the country dances, these continued till half after seven, when at the proposal of several, we played Button, to get pawns for redemption: here I could join with them, and indeed it was carried on with sprightliness, and decency; in the course of redeeming my pawns I had several kisses of the ladies! Half after eight we were rung in to supper. The room looked luminous and splendid: four very large candles burning on the table where we supped; three others in different parts of the room; a gay, sociable assembly, and four well instructed waiters. So soon as we rose from the supper, the company formed into a semi-circle round the fire, and Mr. Lee, by the voice of the Company, was chosen Pope, and the rest of the company were appointed Friars, in the Play called 'Break the Pope's Neck.' Here we had great diversion in the respective judgments upon offenders, but we were all dismissed by ten, and retired to our several rooms."

In the South the boys had much healthful out-of-door sport. They went hunting with their fathers, or with the negro men and learned the habits of the birds and animals. They were taught to ride, to shoot, and to fish, and, when they grew older, went fox-hunting with their elders. To go hunting the "possum" or the coon at night was great sport, and every boy had his traps or snares for rabbits. Girls also were taught to ride, for many of the roads were often so rough that carriages could not be used.

Many of the old negroes were full of stories of beasts and birds, which had probably been brought from Africa with the slave-ships, though, of course, the animals were different. In these stories the animals were made to talk, think, and act like human beings. The "Uncle Remus Stories," by Joel Chandler Harris, are the stories which were told to children in colonial days, as well as to their great-grandchildren.

SWEETMEATS OF MANY KINDS WERE KNOWN

There were pleasant things in the life of the colonial child. In the seaport towns sweetmeats seem to have been plentiful. Ships brought an abundance of sugar and molasses, chocolate and ginger into all the ports. One colo-

nial shop bore this quaint sign upon its door:

"I have Sucket, Surrip, Grene Ginger and Marmalade
Bisket, Cumfet, and Carraways as fine as can be made."

Apparently such toothsome dainties were far more common in the colonies than in England, for one writer says that it was in these long ago days that the foundation was laid for the "American sweet tooth—a wonder!" Then too the colonists learned very early to make maple syrup and maple sugar, and you may be sure that the children had their share of these. "Boys and girls who were fortunate enough to live in coast towns reaped the sweet fruits of their father's foreign ventures. When a ship came into port with eighty boxes of sugar candy on board and sixty tubs of rock-candy, poor, indeed, was the child who was not surfeited with sweets. There was a sequel, however, to the toothsome feast, a bitter dessert. The ship that brought eighty boxes of sugar candy also fetched a hundred boxes of rhubarb and ten of senna." And you may be sure the wise parents did not spare the bitter dose.

The value of a medicine was then judged according to its bitterness. Nowadays the effort is made to make all medicines tasteless or even pleasant to take. But in those days the sugar-coated pills, or the little gelatine capsules which conceal the bitter or nauseous dose had not then been invented. Many of the medicines given were made from herbs such as tansy, thoroughwort, sage and pennyroyal. A mixture of sulphur and molasses was supposed to be good for the blood, and the other doses were hardly less unpleasant.

ARE CHILDREN HAPPIER TO-DAY?

Though it seems that the life of the children about whom we have just read was not very interesting, on the whole they were probably happier than children to-day. They did not have so many toys, and so much was not done for them, but they knew how to get pleasure out of simple things, and the simple pleasures are, after all, the sweetest. They did not expect to have every whim gratified, but gratified others, and there is more pleasure to be found in doing things for others than in having things done for us.

THE NEXT STORY OF THE UNITED STATES IS ON PAGE 993.

The Story of FAMOUS BOOKS

MORE ADVENTURES OF DON QUIXOTE

THE adventures of Don Quixote are told in a very long book, much longer than most stories of the present day, and as it abounds in incidents, the imagination of the author being almost without limit in the invention of comical episodes, in which his ridiculous but gentle-hearted hero usually comes to grief, only a few of these can be told here. We read on page 90² of the first journey of Don Quixote and his inglorious return, but now, in company with Sancho Panza, his squire, he has taken the road again, and we are to follow him in his new adventures.

DON QUIXOTE AT THE WINDMILLS AND THE ADVENTURE IN THE LION'S CAGE

WHILE Sancho was talking as they went along, about the island he was going to govern—he was not quite sure, by the way, what an island was—they came to a plain on which were some thirty or forty windmills.

"Look yonder, friend Sancho!" cried the knight. "There are at least thirty outrageous giants whom I intend to encounter. Having deprived them of life, we will enrich ourselves with their spoils, for they are lawful prize."

Honest Sancho, who saw things as they were, endeavored to convince his master that the "giants" were really windmills. But Don Quixote, regarding this as a sign of magic, told Sancho to stand aside if he was afraid.

This said, he put spurs to Rozinante, and crying out, "Stand, cowards! Be not so base as to fly before a single knight, who dares encounter you all!" was about to charge.

At this moment the wind arose, and the mill-sails began to move.

"Base miscreants!" now cried Don Quixote. "Though you move more arms than the giant Briareus, you shall pay for your arrogance."

Calling upon his Lady Dulcinea, he couched his lance, and, covering himself with his shield, dashed forward to the nearest windmill at the utmost speed of which Rozinante was capable. As he ran his lance into the sail, the wind whirled it about with such swiftness that the lance was shattered, and both knight and horse were hurled to the ground. As on the former occasion, the knight was again rendered powerless.

When Sancho ran up to him, Don

CONTINUED FROM 904



Quixote declared that a wicked magician had transformed the giants into windmills, so as to deprive him of the honor of the victory. Don Quixote's next adventure was of a more dignified character. Engaging in single combat with a Biscayan, he had him at his mercy, and only spared his life when his lady promised that he should go to Toboso and present himself before the Lady Dulcinea that she might dispose of him as she might think fit.

But not long after this, as the result of an encounter with a party of carriers, Don Quixote was seen riding in a limp condition on Dapple, while Rozinante carried his arms, and Sancho Panza, also sorely bruised, was leading the way to an inn, on seeing which Don Quixote declared it was a castle. Here the knight's conduct caused much wonderment, but his wounds were attended to, as were those of his squire.

On being informed by the landlord at the moment of leaving that his imagined castle was but an inn, Don Quixote declared that as no knight-errant had ever been known to pay in such a place, neither would he. Thereupon he rode off. But Sancho Panza, who was behind, was seized and tossed in a blanket, and emerged from this adventure more wretched than his master, who, hearing his squire's cries, came back, but was unable to help him.

As they went on their way, Don Quixote sought in pain to convince Sancho that those who had treated him so cruelly were but phantoms from another world.

"It is as plain as a nose on a man's

DON QUIXOTE TILTING THE WINDMILLS



face," declared Sancho ruefully, "that these adventures, which we hunt for up and down, are like to bring us at last into a peck of troubles. Our wisest course is to jog home and look after our harvest, lest worse mischief befall us."

"Poor Sancho," replied the knight; "how ignorant art thou in matters of chivalry! Come, say no more, but have patience. A day will come when you will be convinced how honorable a thing it is to follow this employment."

So, but with reluctance, Sancho rode on with his master.

Soon after this Don Quixote performed a feat of valor which astonished all. Encountering a wagon, in which two fierce lions were being conveyed to the king, he called upon the keeper to open the cages and let the animals free.

"In spite of the enchanters that have sent them to try me," he cried, "I will make the creatures know who Don Quixote de la Mancha is."

When all save the keeper had fled out of harm's way, and the mules that drew the wagon had, with Rozinante, been taken to a place of safety, the knight compelled the keeper to open one of the cages.

SANCHO PANZA TOSSED IN A BLANKET



Grasping his shield in one hand and his sword in the other, he then took up a position before the cage. The door being set open, a large lion was disclosed to view—an animal that appeared of a monstrous bigness and fearful aspect.

The first thing the lion did was to turn himself round in his cage, stretch out one of his paws, and rouse himself. After that he gaped and yawned, then thrust out his tongue. Then, lifting his head, he stared about with eyes that looked like two live coals. But Don Quixote stood undaunted, and, as the lion turned round and showed his back

to the knight, called upon the keeper to rouse the animal with blows. The keeper advized the knight to be satisfied with his day's work, having displayed his courage sufficiently.

Persuaded at length that, as the challenger, he could do no more, Don Quixote yielded to the man's appeal, insisting, however, that the keeper should give him a certificate of what he had seen performed.

"Well, Sancho," said Don Quixote to his squire afterwards, "what make you of this? These magicians may perhaps rob me of success, but of fortitude and courage they cannot deprive me."

HOW SANCHO PANZA BECAME A GOVERNOR AND THE SAD ADVENTURES THAT BEFELL HIM

ONE day at sunset, as the knight and his squire were coming out of a wood, Don Quixote saw a noble cavalcade, composed of a duke and his lady and their retainers. It was a hawking party. The knight sent Sancho forward to pay his respects to the lady, and to say that the Knight of the Lions, as he now proclaimed himself, would be proud to receive her command.

Now, it happened that the lady had heard of Don Quixote's remarkable adventures, and she received Sancho with great courtesy, Don Quixote and his squire being invited by the duke and duchess to their castle. Learning the knight's story, the duke resolved to gratify Sancho Panza's ambition to be a Governor and to rid Don Quixote of his foolish humor.

With this end in view he arranged a pageant, which he and his guests came upon one day as if by accident. In this pageant there rode a beautiful damsel, by whose side was a terrible-looking figure representing a magician. When the procession stopped, the magician, drawing himself up, declared that the damsel by his side was none other than the Lady Dulcinea, and that there was but one way by which she could be released from her troubles. This was that Sancho, who had played a trick upon his master by presenting to him a country woman as his beautiful Dulcinea, should inflict upon himself 3,300 lashes.

Upon hearing this Sancho loudly bewailed his fate, and declared that his master should bestow the lashes upon his own person. Overcome, however, by the protests that arose against his cowardice, Sancho consented to perform the penance, if he was appointed to the governorship and was allowed to give himself the stripes when he pleased.

That night Sancho gave himself five slaps with the flat of his hand. Some days later, Don Quixote, taking Sancho aside, imparted to him some wise counsel respecting his conduct as Governor.

After this Sancho was conducted by the duke's steward to the seat of the governorship, which was known as the Island of Barataria. When he came to the gates of the town, he was met by the officials, and the people gave de-

monstrations of joy. His first duties took him to the Hall of Justice, where he had to judge a number of cases. He was next conducted to a sumptuous palace, where arrangements had been made for a Royal feast. When the music had ceased, Sancho took his seat at one end of the table, which was only laid for one.

An official, who appeared to be the Court physician, came and stood at his elbow, with a wand of office in his hand. One that looked like a student said grace. A page put a laced bib under the new Governor's chin. Then another servitor placed before him a dish of fruit. But Sancho had hardly tasted this, when the physician touched the dish with his wand, and it was taken away in an instant.

This happening several times, the amazed Sancho asked if he was expected to eat his dinner like a juggler.

"My lord Governor," answered the man with the wand, "you are to eat here no otherwise than according to the use of other islands where there are Governors. I am a doctor of physic, my lord, and I have a salary allowed me to attend the Governor's meals, to let him eat what I deem good for him, and to remove what I regard as harmful."

After much discussion Sancho asserted his right to eat what he wished. But he wrote a letter to his old master on the woes of office.

One night Sancho was aroused by a fearful din. Hastily jumping up, he was met at the door of his apartment by a body of armed men with swords and lighted torches in their hands.

"Arm, my lord Governor!" they cried. "A world of enemies have got on to the island, and we are lost unless your valor save us!"

They brought him two huge shields, tied one in front and the other behind him, and, putting a lance in his hand, called upon him to lead the way against the enemy. Poor Sancho, directly he attempted to move, fell down as helplessly as did Don Quixote when he rode at the merchant.

Thereupon there was another great uproar, which was followed later by cries of "Victory!" Told that he had caused

SANCHO PANZA AT THE ROYAL FEAST



the enemy to be routed, Sancho asked nothing more than to be unburdened of the huge shields and to be given some wine.

After this he dressed himself, and, going quietly to the stable, followed by the whole company, he embraced Dapple, gave him a loving kiss, and, with tears in his eyes, cried :

"Come hither, my faithful companion. When thou and I were together, and all my cares were but to mend thy

trappings and feed thy little carcase, then happy were my days. But since I forsook thee, and clambered up the towers of ambition and pride, a thousand woes, toils, and tribulations have haunted my soul."

With this he mounted his old friend, and rode forth to liberty, remarking that a man should stick to the calling he was born to, and that he would rather eat a mess of plain porridge than be at the mercy of a physician who starved him.

DON QUIXOTE AND THE CLOUDS OF DUST

THE ADVENTURES WITH THE ARMIES OF SHEEP

AS they continued on their way, they saw a thick cloud of dust arise before them.

"The day is now come," said Don Quixote, on seeing this. "The day is come, Sancho, that shall usher in the happiness that is in store for us. That cloud is raised by a great army on the march."

"Why, then," said Sancho, "there must be two armies, for yonder is as great a dust on the other side."

Don Quixote looked and was thereupon transported with joy. His imagination at once leapt to the conclusion that two vast armies were about to engage each other on the plain before them. So clouded was his brain that he could not see that the dust was raised by two flocks of sheep going in the same direction from different parts. The dust being so thick as to hide the cause of it, Sancho at first believed that what his master said was right.

"What shall we do?" he asked, in great alarm.

"Do?" exclaimed Don Quixote. "What but assist the weaker and injured side? The army, Sancho, which now moves towards us is commanded by the great Alifanfaron; the other is his enemy, the King of the famous Garamantians, Pentapolin with the naked arm, so called because he always enters into battle with his right arm bare."

Recalling what he had read from foolish books, Don Quixote proceeded to describe to his squire the causes of the quarrel. At this point they mounted a hillock, from which Sancho, to his amazement, could only see the sheep, which were being driven along by some peaceful countrymen.

"Why," said he, "you might as well tell me that it snows. Not a man, nor a knight, nor a giant such as you name, can I see, but only sheep."

"Dost thou not hear their horses neigh, their trumpets sound, and their drums beat?" asked the knight.

"Not I," replied Sancho; "I can hear nothing but the bleating of sheep,"—for the two flocks were now very near to them.

"Thy fears disturb thy senses," said Don Quixote, "and hinder thee from hearing and seeing right. But since thou art so terrified, withdraw to some place of safety. For I alone am sufficient to give the victory to that side which I shall favor." And so, couching his lance, setting spurs to Rozinante, and heedless of what Sancho Panza said, Don Quixote rushed forward upon the sheep.

"Courage, brave knights," cried he, laying about him with all the vigor possible, "fall on all of you who fight under the standard of the valiant Pentapolin. Follow me, and you shall see how easily I shall revenge him on that infidel Alifanfaron."

Seeing what destruction the knight was causing, the shepherds and drovers who were with the sheep called out to him to desist, and, finding that their cries were of no avail, they proceeded to unloose their slings and to ply him with showers of stones as big as their fists. But Don Quixote only laid about him with greater energy, until one of the stones struck him so violently in the face that it knocked out several of his teeth and caused him to fall heavily to the ground and lose his senses.

As he lay motionless, the shepherds, fearing he was killed, got their flocks together, and, carrying away the dead sheep, of which there were about seven, departed with haste.

When Sancho had come to his master's assistance, Don Quixote, sorely hurt as he was, groaned out that this fresh trouble was again the work of an enchanter, and begged Sancho to follow the sheep, declaring that if he did so he would soon find them resume their former shapes. But Sancho was not to be persuaded this time, and the knight had to yield to his suggestion that they should find their way to a lodging where they might rest.

Shortly afterward knight and squire returned to their native village, wiser, if sadder, than when they first left it. And Don Quixote, dying in his right mind, was deeply mourned by all who knew him, and especially by Sancho Panza.

THE NEXT PART OF THIS IS ON PAGE 1125.

THE ENCHANTED HORSE

AS the Shah of Persia was keeping the Feast of the New Year in the city of Shiraz, an Indian magician came to his Court, leading a very ugly horse. It walked in a jerky way, and looked more like wood than a living creature. The Shah could hardly help laughing when he saw it.

"Laugh as you will, sire," said the magician, "I think you will be glad to pay a great price for my horse when you know what it can do. If your brave young son, Prince Frouz, will deign to mount it, and turn the peg in the saddle, he will be able to test its power."

"Well, let me see what it can do," said the Prince.

He sprang upon the horse, and, without waiting to learn how to manage it, turned the peg in the saddle. The strange animal at once rose with him into the air with the swiftness of an arrow, and carried him out of sight.

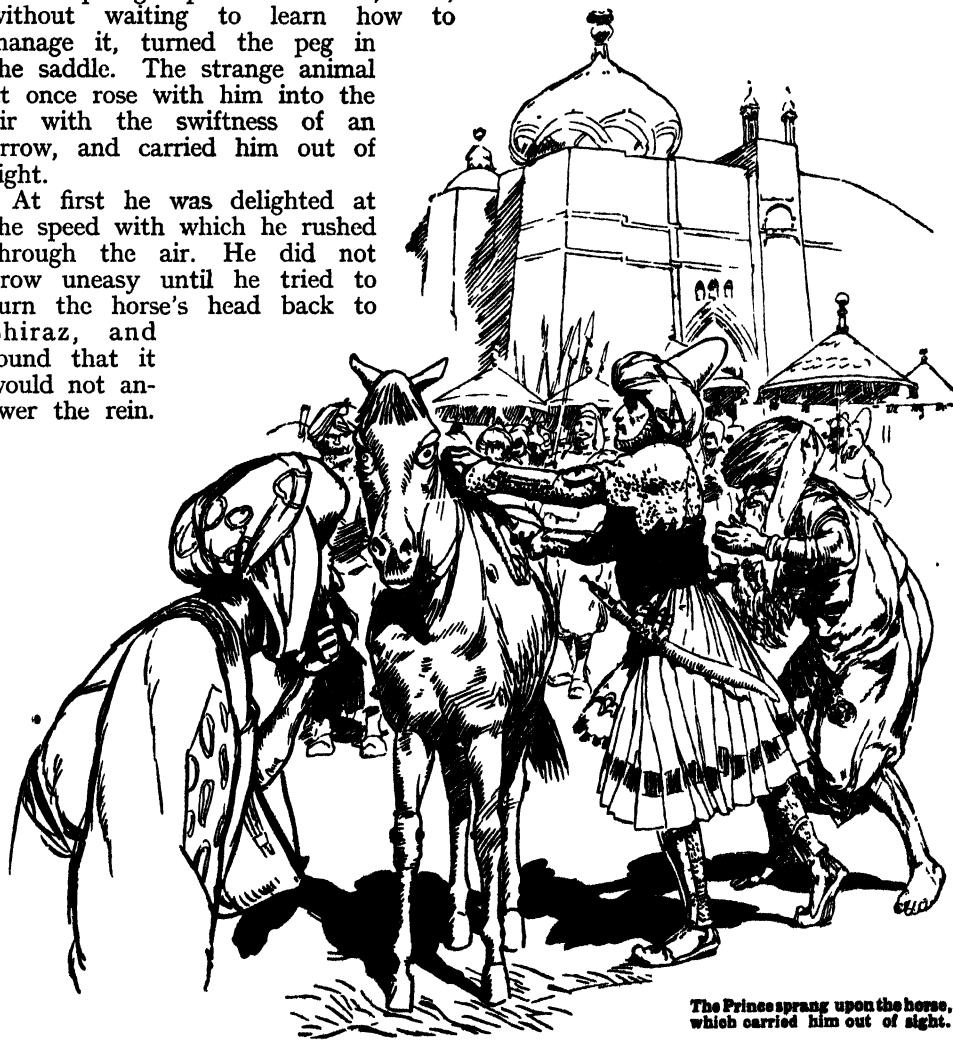
At first he was delighted at the speed with which he rushed through the air. He did not grow uneasy until he tried to turn the horse's head back to Shiraz, and found that it would not answer the rein.

"I suppose," he said, "I must twist the peg the other way."

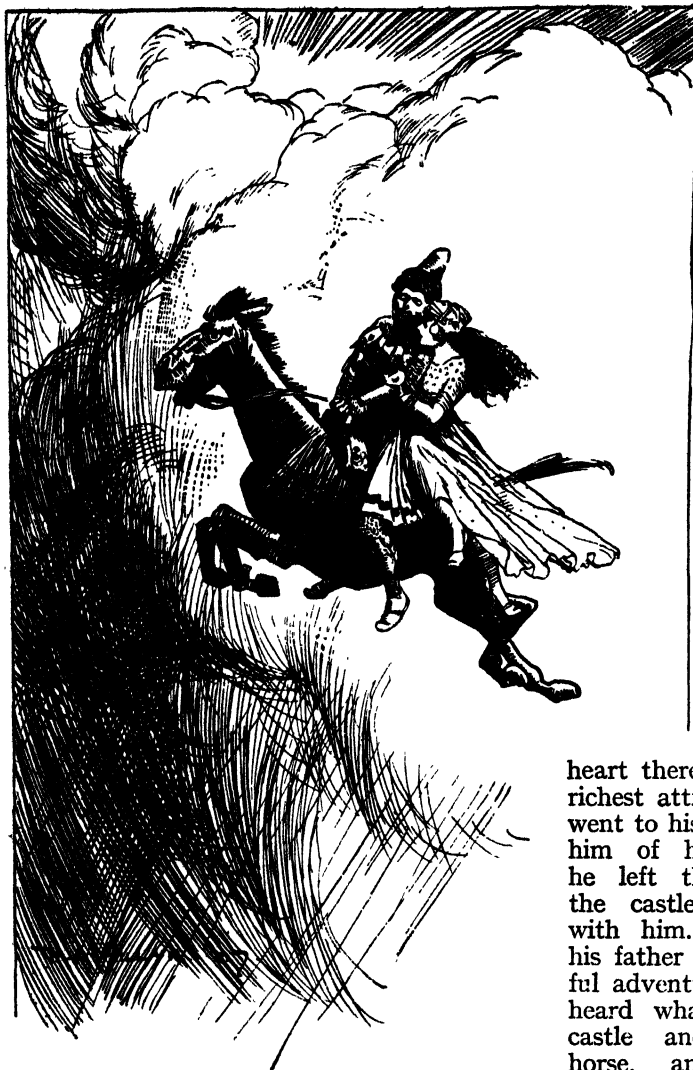
He did so, and, to his alarm, the horse leaped up higher into the sky, and began to travel as fast as lightning.

Prince Frouz did not lose his wits, and after examining the saddle he found another smaller peg. He gave this a wrench, and the horse then stopped, and carried him gently downwards, and he alighted, tired, weak, and hungry, on the terraced roof of a strange, great palace.

It was now night, and everybody was in bed. Prince Frouz crept downstairs, and came into a splendid hall. There he saw a lovely young lady sleeping on a



The Prince sprang upon the horse, which carried him out of sight.



He placed her upon the enchanted horse, and sprang up beside her, and in less than an hour they were home.

couch, with ten women reposing around her. Going up to the couch, he awoke the lady, begged her pardon, and told her the story of his wonderful adventure.

"And now," he said, "may I ask, my sweet lady, who you are, and where I am?"

"You are in the palace of the Princess of Bengal," said the lady kindly, "and I am the Princess."

She then called her women and bade them set out a repast for Prince Frouz, and conducted him to a Royal bed-chamber. The Prince slept soundly, and rose up fresh and gay of heart, and the Princess sent for him and begged him to tell her again the story

of his wonderful adventure. They remained together all day long, and the result was that they fell deeply in love with one another.

At break of day next morning, before anyone else was awake, the Princess climbed to the terraced roof of the palace and found the Prince waiting for her, and they both mounted the enchanted horse and set out for Persia, where they intended to get married. The Prince now knew how to manage the horse, and in a short time he arrived with the Princess at a castle a little way from Shiraz.

Leaving his sweetheart there to array herself in her richest attire for the wedding, he went to his father, the Shah, to tell him of her coming. Unhappily, he left the enchanted horse at the castle instead of taking it with him. While he was telling his father the story of his wonderful adventure, the Indian magician heard what he said, ran to the castle and got the enchanted horse, and exclaimed to the Princess:

"The Shah wishes to see you at once, and Prince Frouz has asked me to fetch you. Mount with me on the horse, and we shall reach Shiraz in a moment."

The Princess got up beside the magician, and he at once turned the horse's head away from Shiraz, and carried her off to Cashmere. They descended in a road near the chief town of that country, just as the Sultan was riding by.

"Save me!" cried the Princess. "Save me from this wicked man!"

The Sultan of Cashmere was amazed at her loveliness, and with one stroke of the sword he slew her enemy, and then he led her kindly into the stateliest

room in his palace, and commanded a hundred slaves to wait upon her.

"I have escaped from one snare," she said to herself, "and fallen into another."

So she had. The Sultan was wildly in love with her, and instead of taking her back to Prince Frouz, he arranged to marry her himself.

But the Princess was as subtle as she was beautiful, and she frightened him away by pretending that she was mad. He sent his wisest doctors to cure her, and she rushed upon them, raging like a madwoman, and they, too, fled in terror.

One day a strange physician came to the Sultan, and promised to take the madness away from the Princess.

"You see, sire," he said, "the lady has been bewitched by riding an enchanted horse. Let me place her again on the horse, and I will cure her."

The Sultan was delighted, and the strange physician was taken to the Princess. "Do you not know me, dearest?" he whispered.

It was Prince Frouz, who had been wandering in disguise all over the world in search of her.

He placed her upon the enchanted horse, and sprang beside her, and in less than an hour he brought her to Shiraz. And then they were married, with the consent of the Shah, and to the joy of all the Persian people.

THE FOX AND THE FAITHFUL HORSE

A FARMER had a horse that had been an excellent, faithful servant to him, but he was now grown too old to work; so the farmer would give him nothing more to eat, and said, "I want you no longer, so take yourself off out of my stable. I shall not take you back again until you are stronger than a lion." Then he opened the door and turned him adrift.

The poor horse was very melancholy, and wandered up and down in the wood, seeking some little shelter from the cold wind and rain. Presently a fox met him.

"What's the matter, my friend?" said he. "Why do you hang down your head and look so lonely and sad?"

"Ah," replied the horse, "my master has forgotten all that I have done for him so many years, and because I can no longer work he has turned me adrift, and says unless I become stronger than a lion he will not take me back again."

However, the fox bid him be of good cheer, and said:

"I will help you. Lie down there, stretch yourself out quite stiff, and pretend to be dead."

The horse did as he was told, and the fox went straight to the lion who lived in a cave close by, and said to him:

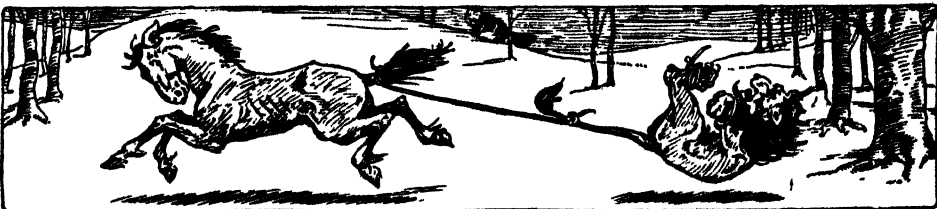
"A little way off lies a dead horse. Come with me, and you may make an excellent meal of his carcase."

The lion was greatly pleased, and set off immediately; and when they came to the horse the fox said:

"You will not be able to eat him comfortably here. I'll tell you what: I will tie you fast to his tail, and then you can draw him to your den, and eat him at your leisure."

This advice pleased the lion, so he lay down quietly for the fox to make him fast to the horse. But the fox managed to tie his legs together, and bound all so hard and fast that with all his strength he could not set himself free. When the work was done, the fox clapped the horse on the shoulder, and said, "Jip, Dobbin! Jip!" Then up he sprang, and dashed off, dragging the lion behind him. The beast began to roar and bellow, till all the birds of the wood flew away for fright; but the horse let him roar on, and made his way to his master's house.

"Here he is, master," said he. "I have got the better of him." And when the farmer saw his old servant his heart relented, and he said, "You shall stay in your stable and be taken care of."



MONA AND THE FORSAKEN MERMAN

MONA was the prettiest girl in the Scilly Isles. One day she was standing on a rock by the sea-shore, and the King of the Mermen saw her and fell in love with her. Catching hold of her foot, he dragged her down to his palace beneath the sea.

He was an ugly old man, and Mona did not like him, and would not wed him. His son, who was a kind and handsome young merman, also fell in love with Mona, and she fell in love with him. This made the King very angry, and he said to the Prince:

"It is time that you were married. I have chosen the fairest mermaid in my kingdom for your wife, and the wedding will take place this afternoon. Make haste and dress for it."

Then, taking Mona to the kitchen, he said: "You will have to prepare the wedding feast. If all the pies and tarts and puddings are not ready in an hour I shall cut off your head."

There were only rows of empty pots in the kitchen, and Mona could not find anything to cook.

But when the wedding party entered the church, the young Prince spoke.

"I have forgotten the ring," he said. "I must run back and get it."

On reaching the palace he rushed to the kitchen and found Mona in tears.

"Let me help you," he said. "This is how mermen prepare dinners."

He touched the pots with a magic wand and filled them with meats and puddings, so that when the wedding party came back to the palace Mona had an admirable feast ready for them. The King of the Mermen saw it and he was furious.

"Someone has been helping you," he said. "I will see into this."

At midnight the Prince and his bride retired to their room.

"Stand by their door and hold this lighted candle," said the King to Mona. "When it has burned half-way through I shall cut off your head."

When the candle was burned nearly half-way, the Prince asked his bride to hold it while Mona lighted the fire.

"Is the candle burned half-way through?" said the old King.

"Yes," said the bride.

And with one sweep of his sword he cut off her head. The next morning the Prince asked his father if he might marry.

"You were married yesterday," said the old King.

"But you have cut off my wife's head," said his son.

When the old King understood what had happened he thought that, after all, he had better let Mona and his son marry. So they were married, and for some years they lived together very happily, and Mona had two charming little baby mermaidens. One day Mona asked if she might go up to earth once more and visit her mother and father.

"Very well," said the merman. "I will build an enchanted bridge of crystal stretching from our palace to the Scilly Isles. You must be careful not to let any man kiss you, and I will wait for you by the sea-shore at sunset, and bring you back safely beneath the waves."

Everybody in the island had thought that Mona was drowned. Her father was wild with joy to see her again, and he ran up and kissed her very tenderly. But as soon as her lips touched his, she forgot all about her husband and her little mermaidens and her palace under the sea.

She was not able to remember where she had been. Yet she would sit for hours by the shore and gaze sadly at the waves, and try to think of something that had happened there. Sometimes as she lay awake in her father's cottage she seemed to hear voices calling.

"What a strange noise the wind is making to-night!" she used to say.

But one summer night, when her window was wide open, someone came beneath it and called her.

"Ah, Mona, Mona!" he said. "You promised to return at sunset, and you keep me waiting still. Mona, have you forgotten the merman who loved you? Your little baby mermaidens cry for you, Mona, and you do not come."

Mona listened, and everything came back to her mind. She jumped up out of bed and opened the cottage door. The merman was standing there, and she returned with him to her palace under the sea and was never seen again on the earth.



MONA AND THE MERMAN PRINCE IN THE PALACE AT THE BOTTOM OF THE SEA

Standing by the sea-shore, Mona was seized by the King of the Mermen, and carried to his palace at the bottom of the sea. The King's son, a kind and handsome young merman, fell in love with Mona.

ST GEORGE AND THE DRAGON

ST. GEORGE of Merry England was the youngest and the bravest of the seven champions of Christendom. Clad in bright armor, with his magic sword Ascalon by his side, he used to travel on his war-horse in far countries in search of adventures.

One day, as he was riding across a marsh in the land of the pagans, he saw a noble and lovely maiden walking all alone towards the sea-shore.

She was dressed in beautiful robes, like a bride on her wedding-day, but her face was pale and sorrowful, and she stared in terror at the sea.

St. George rode quickly up to her. On hearing the sound of his horse's hoofs, the girl turned round, and cried :

"Flee, young knight, flee, or you will perish also !"

"God forbid that I should flee when a maiden is in peril!" said St. George.

As he spoke the sea in front of him began to rise up in great waves, and from the waves there came the sound of roaring. At the same time he heard a noise far behind him. He turned round, and saw that the walls of the city on the hills above the marsh were crowded with people, who were shrieking and wringing their hands.

"The dragon, the dragon!" cried the maiden. "Flee, or it will be upon you!"

The sound of roaring grew louder.

"Flesh and blood cannot withstand the burning flame that comes from its jaws," said the maiden. "It has destroyed two armies of soldiers; it has eaten up all our sheep and cattle, and laid waste my father's kingdom. Escape while you can, and do not try to defend me!"

"Every year a young virgin comes to this marsh to be killed and eaten by the monster, in order to prevent it from rushing upon the city and slaying all the people. I am Princess Sabra, the daughter of the King, and the lot has now fallen upon me. Oh, horror, you are too late!"

While Princess Sabra was speaking, the sea began to rise up in greater waves, and from the waves there came a louder and louder sound of roaring. St. George

had scarcely time to clutch his spear and lift up his shield before the dragon was upon him.

It was the most terrible monster that was ever seen on earth. It was an enormous serpent, with two great wings and four strong feet, armed with cruel claws, and in its tail there was a long, poisonous sting.

It rushed through the air upon St. George, and a burning flame came from its jaws. With a sudden stroke of its wing, it nearly felled him to the ground; but as it passed he gave it so fierce a thrust that his spear broke into a thousand pieces. Swinging back, the dragon again struck at him with its tail, and swept him from his horse.

He rose up reeling like a dying man, for the fire of its breath made him faint and dizzy, but his strength returned when he drew his magic sword, his faithful Ascalon.

In trying to strike him once more, the dragon exposed the tender part of its body beneath its wing, and there St. George wounded it. So deep was the wound that the dragon stood still and trembled. St. George then knelt down and prayed.

"Undo your sash and tie it about the dragon's neck. It will not harm you," he said to Princess Sabra.

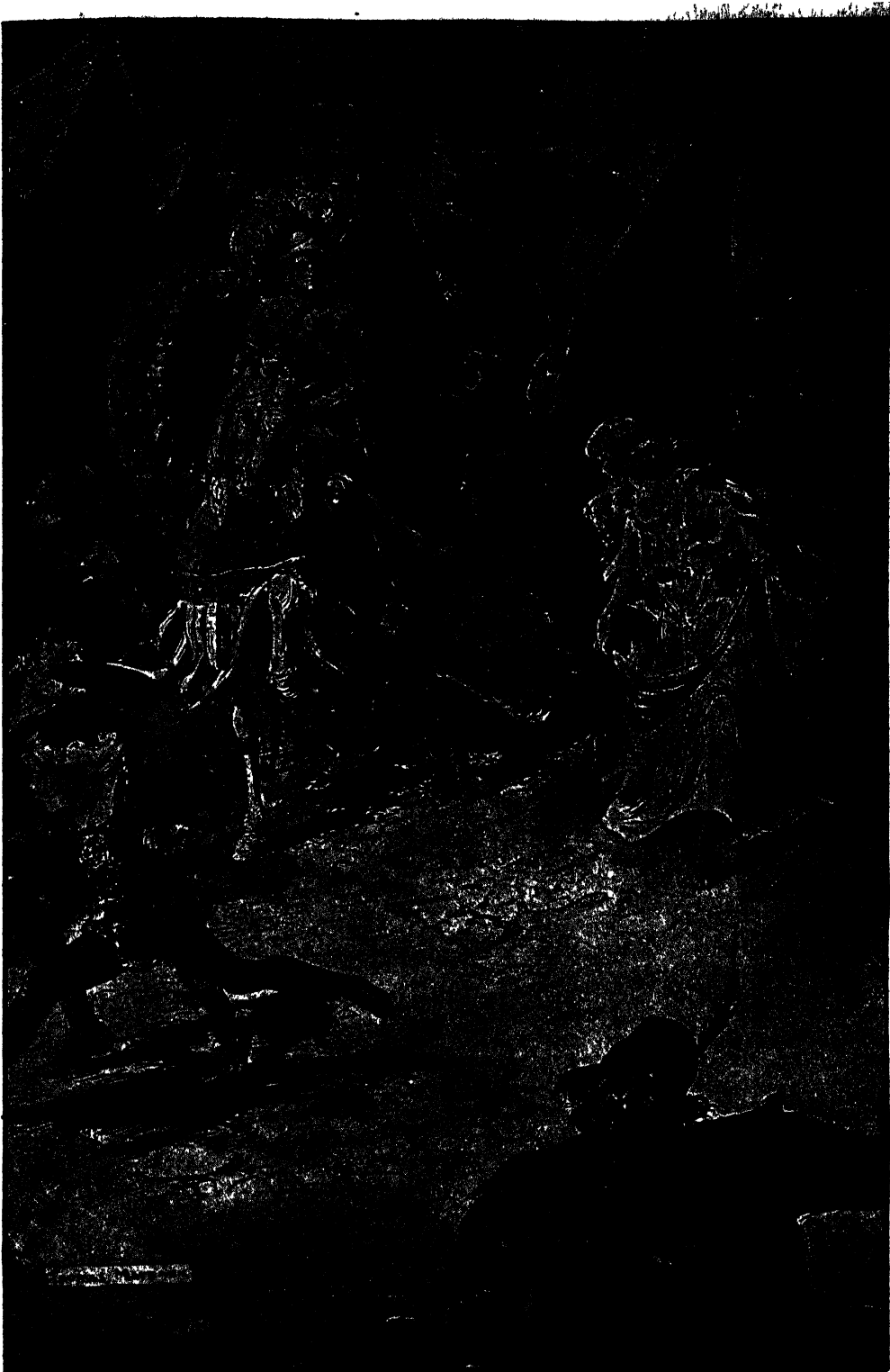
The Princess did so.

"Now lead it to the market-place in the city," he said.

The dragon followed the Princess as meekly as any lamb. When they reached the city, all the people fled, but St. George told them to have no fear; and with a blow of his magic sword Ascalon he killed the monster in the market-place.

"This I did," he said to the pagans, "to show to you the power of God, and to bring you to a knowledge of the true faith."

When the pagans learned that it was a Christian knight who had subdued and slain the dragon, they gave up their false idols and became good Christians. Princess Sabra was the first to be baptised, and it was not long before she was married to her true knight, St. George, the patron saint of Merry England.



ST. GEORGE AND THE PRINCESS LEADING THE DRAGON TO THE MARKET-PLACE

"Tie your sash about the dragon's neck and drag it to the market-place," St. George said to the Princess, and she did so. The people fled as it came along, but the dragon was as meek as a lamb.

THE IVORY MAIDEN WHO CAME TO LIFE

THE sculptors of ancient Greece were the cleverest in the world. The images which they made out of gold and ivory and exquisite marble were of wonderful beauty. The most marvelous of these statues was the ivory maiden carved by Pygmalion, the King of the island of Cyprus. It was a figure of divine loveliness, and it seemed to breathe.

When Pygmalion finished his work, he gazed at it at first in a kind of awe. Was it about to move and speak? Then, overcome by a strange and wild passion of love, he clasped the ivory maiden in his arms, and tried to kiss her into life.

But all in vain. No mortal kisses had the power to change cold and hard ivory into warm and tender flesh.

Happily, however, Venus, who was the goddess of love, was deeply moved by Pygmalion's strange wild passion for a statue. And as he was again clasping his work and kissing it, Venus came and breathed life into it, and the ivory figure slowly changed into a living maiden in the sculptor's arms. Then, to the great joy of Pygmalion, he found that his beloved loved him as passionately as he loved her. She was named Galatea, and they were married in great splendor, and lived very happily together.

PENELOPE'S MARVELOUS TAPESTRY

PENELOPE, a celebrated princess of Greece, was the wife of Ulysses, the brave warrior of whose prowess many tales are told.

One day Ulysses told Penelope that war had broken out in Troy, and that he must go and help to fight.

Penelope was sad to be left all alone, but determined to be brave and look forward to his return. But the wars lasted many years, and Ulysses was away so long that everybody thought he must be dead. Penelope alone believed that he still lived.

At last foreign princes came to the land, and, seeing how beautiful Penelope was, wanted to marry her.

But Penelope refused to believe that Ulysses was dead, and would have nothing to do with the princes, who declared that they would not go away

till she promised to marry one of them. This made Penelope unhappy, but as she sat at her work one day she thought of a plan to keep the princes from troubling her.

"When this piece of tapestry is finished," she said, holding out a beautiful piece of needlework, "I will choose another husband."

All day Penelope worked at the tapestry, and at night, when she was alone, she unraveled all she had done in the day. In this way the work was never finished. The princes were amazed at her industry, but as the princess would not marry until it was done they could only wait and leave her in peace. Then at last, after he had been away twenty years, Ulysses came home from the wars, to find his beautiful wife still waiting.

ACHILLES AND THE QUEEN OF THE AMAZONS

THE Amazons were a warlike race of women who lived near the Black Sea. They never allowed any man to dwell in their country, and they even sent their own sons away, and brought up only their daughters. They were strong and hardy in body, and brave and daring in soul, and they delighted in hunting and fighting. But one day, when they were hunting, their Queen shot an arrow at a deer, and missed it, and killed her own sister.

"I will not slay myself," said the Queen. "I will die on the sword of the bravest man in the world."

Achilles was then the bravest man in

the world, and he was fighting among the Greeks and against the Trojans. So the Queen of the Amazons gathered an army, and marched to help the Trojans. At first Achilles would not fight with women, but the Amazons charged the Greeks and defeated them, and he had to appear.

The Queen of the Amazons fell in love with Achilles as soon as she saw him, yet she struck him fiercely and hurt him, and he struck back and hurt her. Then, when he saw how young and lovely and valiant she was, he fell in love with her. But it was too late. He had killed her.

THE NEXT STORIES ARE ON PAGE 1045.



THE RACE WITH THE WOLVES

ONE still night in the depth of winter a Russian baron set out from the little frontier town of Rob-rin. The snow lay knee-deep in the streets, and was still falling as the baron, with his wife and child, and his servant Eric, got into the sledge and started on the next stage of his journey home to Petrograd.

The landlord of the inn begged him not to attempt to travel that night, as the roads were full of snowdrifts, and packs of hungry wolves were known to be in the neighborhood. But the baron was anxious to get on to the next town, called Bolisov, and so the order was given to start, and the four horses dashed forward into the darkness.

About an hour afterwards, as they approached a great forest through which they had to pass, the baron's wife suddenly exclaimed:

"Hark! What was that?"

The party listened intently, and then in the distance they heard a long, melancholy wailing that rose and fell on the still night air. There was no mistaking that sound; it was the howling of a pack of wolves. The horses heard it, too, and in their terror galloped faster than ever. But little by little the terrible howling grew nearer.

The baron and his servant got ready their pistols, and none too soon, for, looking back, they saw grey, shadowy forms coming across the snow, and they knew that the wolves were fast overtaking them. Faster and faster flew the horses, straining at the harness and rocking the sledge from side to



CONTINUED FROM 635

side. But the wolves drew steadily nearer. There were a large number of them, led by an enormous old grey wolf who, as soon as he got alongside, tried to spring upon one of the horses. Bang went Eric's pistol, and the wolf sprang into the air and fell down dead. At this the others fell back for a few moments, but they were soon again in full pursuit. This time the baron and Eric fired together, and four wolves fell dead in the snow. The rest of the pack paused for a moment hastily to devour the fallen wolves, but they, too, were soon again in full pursuit.

"There is no help for it. We must turn one of the horses loose," cried Eric. "Cut the traces."

This was done, and one of the leaders dashed aside into the forest, with the whole pack of wolves after him.

"We are saved!" cried the baron.

But his servant Eric knew only too well that the hungry animals would soon come on again. Surely enough they did, and then another horse had to be sacrificed to gain a few moments' time.

The carriage was now within two miles of Bolisov, and the lights of the outlying houses could be seen in the distance. The party in the carriage thought they were saved; but as they galloped along it became evident that the horses were tired out, and were slackening speed, while the wolves were once more rapidly overtaking the party. Then it was that the servant Eric proved himself a hero.

"I will get down, baron, and keep the wolves at bay while you, with your

wife and child, get away to the town. If we stay together we shall all perish. But perhaps I may have time to climb a tree, or I may manage to keep the wolves off till you return with help. If they kill me, take care of my wife and child!"

The baron could not bear the thought of losing his faithful servant in this way, but Eric was determined to risk his life to save his master. The wolves were now on both sides of the carriage, and the leading ones were snapping at the horses' legs.

"Now God be with you all!" cried Eric. "Fire as I jump out!" The

baron fired, and his faithful servant sprang into the midst of the wolves. The savage animals stopped for a moment with the blaze of the pistols in their eyes. Then came a fearful, savage yell, and Eric fired again at the wolves. Then there was silence as the horses dashed forward to the town.

Eric was never seen again, but his pistols were found lying in the blood-stained snow. A stone cross now stands on the spot bearing the name of the hero on one side, and on the other the words: "Greater love hath no man than this, that a man lay down his life for his friend."

HOW THE CHILDREN SAVED THE TOWN

THE little town of Spinalunza, in Italy, was built on a long ridge of rock, surrounded on three sides by a deep ravine, so that an enemy could attack it only from the west. On the hill-top stood the cathedral, with its great square, where the children played amid orange-trees and pomegranates.

Long ago, in the autumn, a fierce captain, with 800 horses and 2,000 men, knocked at the gates of Spinalunza, demanding admission in the name of Pisa. The war bell was rung, and the people ran to defend the walls. In the morning the captain shouted from outside: "We are from Pisa; Florence is attacking us, and we must hold this town for our safety. All we ask is a pledge that you will not join Florence against us."

"What pledge do you ask?"

"Let twenty of your children ride back with us to Pisa; they shall be well cared for."

A messenger was sent out to the captain to say: "To-morrow the gates will be thrown open, and the children will come out for you to choose twenty."

The enemy spent the night in drinking; the children slept while their parents prayed. An hour after midnight the garrison met in the square, and were divided into two bands. These were ordered to descend into the ravine on the eastern side of the town, and make their separate ways until they had the enemy between them.

At daybreak the bells began to ring, the gates were thrown open, and the children trooped out, singing and holding a cross aloft. The townspeople wondered as they saw behind each child an angel with a fiery spear. As the singing children swept through the gates, panic seized upon the foe. Their horsemen fled, plunging in terror through the ranks of the footmen, and in this scene of confusion the townsmen, waiting in the woods, rushed down and put the enemy to rout.

So the children saved the town, and if you go to Spinalunza you will see groups of children playing still in the cathedral square.

THE UNDYING LOVE OF A SISTER

TWO young Romans, Simplicius and Faustinus, had a much-loved sister—a noble maiden named Beatrice. They lived in Rome at a time when persecution of the Christians had ceased, and all three worshipped the living Christ in peace.

But a new emperor came to the throne, and the old martyrdoms began again. The two brothers were called upon to deny Christ. They refused. Then they were tortured, beheaded, and their bodies were thrown into the river.

Beatrice haunted the riverside to rescue their dear bodies from dishonor. And she found them, and carried them in secret to a cemetery and gave them Christian burial. Then it came to her turn to suffer, and, refusing to worship idols, she was strangled.

A faithful old woman who had helped this brave girl to find the bodies of her brothers, rescued the body of Beatrice, and laid it in the same grave with her brothers.

THE NEXT GOLDEN DEEDS ARE ON PAGE 1069.

The Book of SCHOOL LESSONS

WHAT OUR LESSONS TEACH US

HERE are some more pictures to help us to read words of four letters. In the writing lesson we learn five new letters, and our arithmetic lesson explains how to write numbers from 10 to 99. The drawing lesson tells us how we can draw a jam-jar, and the music lesson tells the story of the procession in Treble Road; while our picture story in French shows us the party safely on board the boat.

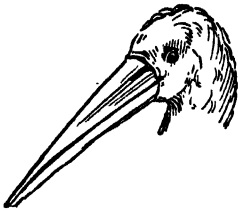
CONTINUED FROM PAGE 748

WORD-BUILDING

LITTLE WORDS OF FOUR LETTERS

Perhaps by this time you feel that you can spell a good many words of two and three letters. If so, you will be wanting to get on to longer words—words with four letters in them. Although these look rather hard and long, they are not really so very bad, and you will soon read them if you try.

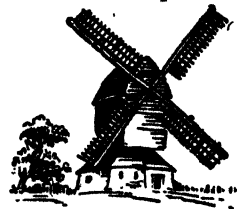
I am sure that you can now tell me that I L L spells ILL. So, if you remember that, you will easily spell the next three words underneath the pictures.



BILL

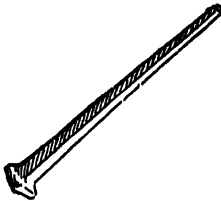


HILL

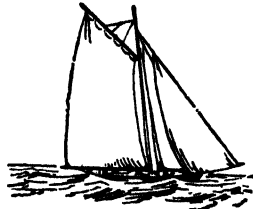


MILL

Then again, A I L spells AIL, and out of this you can make many words of four letters each, such as FAIL, HAIL, PAIL, and those given with pictures below.



NAIL



SAIL

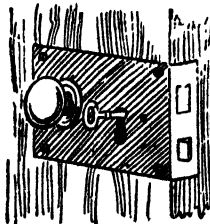


TAIL

You will be able to make many other words from four letters. Perhaps you can make the next words out by yourselves.



COCK



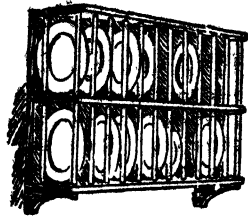
LOCK



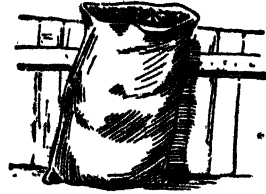
ROCK



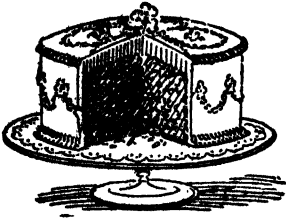
BACK



RACK



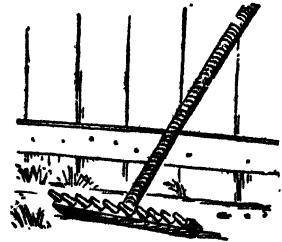
SACK



CAKE



LAKE



RAKE

Now, will it help you if I ask you some questions, and give you the answer in a picture? Here are the questions, and you will all know the answers, I am sure.

What did the cow jump over?



PLUM

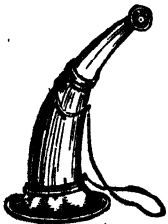
What did Little Jack Horner pull out of his Christmas pie?

What did Old Mother Hubbard look for in the cupboard?



BONE

What was Little Boy Blue asked to blow?



HORN



BOWL

What did the Wise Men of Gotham go to sea in?



SHOE

Where did the old woman live who had so many children that she did not know what to do?

If you would like some little rhymes, here are a few. I am very fond of them myself, and I hope you like them, too.

Has Santa Claus come yet, I wonder?

I must run to my stocking and look.
On top is a ball, and just under

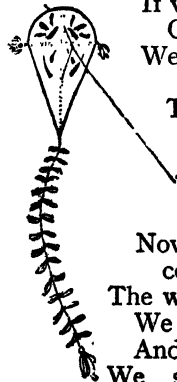
There is something that feels like a BOOK.

Perhaps further down is a dolly,

And some chocolates also, I hope;
Oh, mother, this really is jolly,
And here is a new skipping ROPE!



If when we walk along a lake
Or near a marsh or bog,
We hear a noise, we can't mistake
The croaking of a FROG.



Now for some fun, here comes the sun,
The wind is exactly right:
We let out the string,
And with good hearty fling
We send up our beautiful KITE.

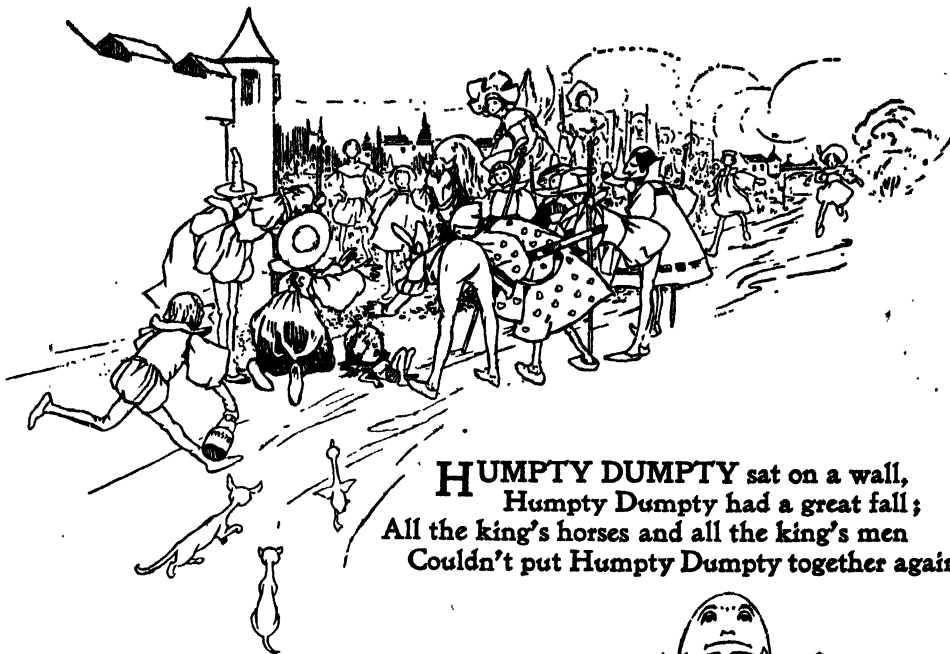
PRIMARY READING LESSON

Humpty Dumpty sat on
a wall,
Humpty Dumpty had a
great fall ;
All the king's horses and
all the king's men
Couldn't put Humpty
Dumpty together again.

Here is Humpty Dumpty.	Oh, Humpty Dumpty,
See him on the wall.	May I sit by you ?
You are up high, Humpty Dumpty.	Is it too high for me ?
Do not fall.	I'll jump and jump and jump !
Oh, Humpty Dumpty,	Is it too high ?
What a fall !	The king's horses came.
The king's horses are coming,	The king's men came.
The king's men are coming !	They saw poor Humpty Dumpty.
Poor Humpty Dumpty.	They tried to put him back again.
	They tried and tried and tried,
	But they could not !

ACTION SENTENCES

Play you are Humpty Dumpty.	Play you had a fall.
Sit on the wall.	The king's horses and men come to pick you up—
What will you do ?	



HUMPTY DUMPTY sat on a wall,
Humpty Dumpty had a great fall;
All the king's horses and all the king's men
Couldn't put Humpty Dumpty together again.

WHEN I was a little boy,
I had but little wit;
It is some time ago,
And I've no more yet.
Nor ever, ever shall,
Until that I die;
For the longer I live,
The more fool am I.



PETER WHITE will ne'er go right,
Would you know the reason why?
He follows his nose wherever he goes,
And that stands all awry.

LADY-BIRD, lady-bird, fly away home,
Your house is on fire, your children
at home,
All but one that lies under a stone;
Fly thee home, lady-bird, ere it be gone.

LITTLE JACK HORNER

Lit-tle Jack Hor-ner sat in a cor - ner, Eat-ing a Christ-mas pie;..... He
 put in his thumb, and took out a plum, And said "What a good boy am I!".....

FIVE NEW LETTERS

AFTER practising o, c, a, and e until they wrote them quite well, Tom and Nora were ready to write r. As their mother was ruling the lines as usual, Tom exclaimed:

"Mother, do let me rule my lines."

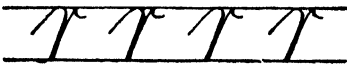
"Of course you shall, Tom. You have often seen me do it."

Tom took the flat ruler, and placed one end of it even with the side of the paper, then pressed the left hand down on the middle of the ruler to steady it, and drew his pencil along the upper edge.

"Very good," said his mother.

Nora ruled lines for herself too, and their mother was pleased that they could do them so well.

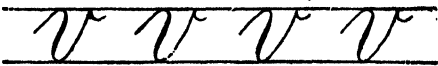
"The first letter to write to-day is r," she said, as she set them some to copy. "How am I making r?"



"It begins like n," said Nora, "but ends in a little tail at the top instead of in a second pot-hook and pot-hanger."

"There is one thing to be careful about," their mother said. "In the second part let your pencil move upwards along the down-stroke again, until it nearly reaches the upper line. You will see why presently. There is another way of making r, and you shall learn about it some day."

When even rows of r's had been written by Tom and Nora, and they had ruled more lines, their mother said they should next write v; so she made some v's for them to copy, and asked how v is like r, and how it differs from it.



Nora looked at the r's carefully and then said:

"I think the first part of v is like the first part of r; but the up-stroke does not go up again over it, but turns round and becomes a pot-hanger, and then ends in a little curly tail like r."

"Quite right," said her mother, "and you can see now why r has its up-stroke carefully made. If the up-stroke separates from the rest, the letter might be taken for a v."

"V is a pretty letter," said Tom, "and so easy—a pot-hook, a pot-hanger, and a curly tail."

Nora liked making it too, and when she had written some really good ones her mother said:

"We all like writing v because it has such pretty curves in it, and is no trouble at all. The next letter will take longer to write."

"What is that?" asked Tom.

"W," was the reply.

"I wonder," said Nora, "whether w is really two u's, like this—uu. Is it, mother?"

But their mother shook her head, and, saying it was much more like one u than two u's, she made them some to copy, like this:

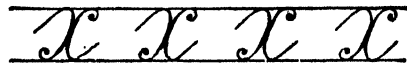


Tom and Nora exclaimed that it was just like u with a little curly tail like that of v. Then they set about writing it, and did it so quickly and nicely that their mother said:

"Capital! Now I am sure you will always know the difference between r, v, and w."

"R, v, and w, three little letters with little curly tails," said Nora.

Then their mother said they had done so well that there was time for two more letters—x and s. So the children ruled more lines and their mother wrote x for them to copy, like this:



"Why, mother, look!" exclaimed Tom. "One c has turned another upside down, and is pushing it backwards!"

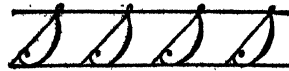
They all laughed at Tom's idea, and Nora said the c upside down did not look very much hurt.

Of course, the second part of x was nothing new to learn, only the first part. The upside-down c had to be carefully made, because it was something quite new to make the down-stroke of a pot-hook turn round to the left. But Tom and Nora tried very hard until they made the c's lean up against each other in quite a friendly way.

When Tom and Nora had made some really good x's, their mother said they should learn another letter.

"What are we going to write now?" asked Tom.

"You are going to learn s," said their mother. "S has a long, light up-stroke, and then curves down and round to the left, as the first part of x does; but be very careful to make the dot curl round right on the light up-stroke, just as I make it here."



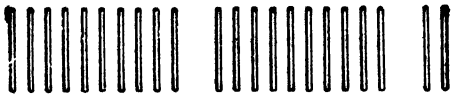
S looked easy, but it wanted a good deal of practice, just as o had done, and Tom especially had to try again and again before he could make a nice row, with each letter like the one before it.

In our next lesson we shall see how Tom and Nora learned to make letters that go outside the lines.

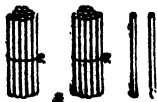
ARITHMETIC

HOW WE COUNT FROM 10 TO 99

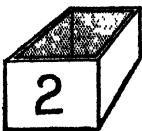
AT the end of the last lesson we said we were going to count a big number of cards, or pencils—a number bigger than twelve. To learn how to do this, let us count *ten* of the pencils in the picture, and tie them into a bundle. When we have done this we will count another ten and make another bundle. After that, you see there are only two pencils left. Here are the pencils:



They made two bundles, and left two pencils over.



Now, we must not get the odd pencils mixed up with the bundles, so let us have two boxes. In one box we will put the bundles, and in the other we will put the pencils which were left over. But we will always be careful of one other thing—always to put the box for the bundles *on the left-hand side*, and the box for the separate pencils *on the right-hand side*. Then, too, we put a figure on each box to tell us how many bundles are in the left-hand box, and how many loose pencils in the right-hand box.



Box for the bundles. Box for the loose pencils.

We will try to remember, then, that when we counted the pencils in the first picture, tying them up into bundles

of ten, we found two bundles and two loose pencils, so that the figures on the boxes were $\boxed{2} \boxed{2}$.

Take the pencils out of the boxes, rub out the figures, and let us try another number.

For our next attempt we need not have a picture of the pencils; straight strokes will do instead.



Count ten of them, and make a bundle. Count ten more, and make a second bundle. Ten more yet will make a third bundle; and then we have one—two—three—four—five loose strokes left. So we have three bundles to put into the left-hand box, and five loose strokes to put into the right-hand box. The numbers on the boxes will look like this: $\boxed{3} \boxed{5}$.

Suppose, now, somebody else had been counting pencils in the way we have just been doing, and that they had made a figure 9 on the left-hand box and a figure 7 on the right-hand box $\boxed{9} \boxed{7}$. How many pencils would that mean? It would mean there were 9 bundles with ten in each bundle, and 7 loose pencils besides. Or, again, if they had put a figure 4 on the left-hand box and a figure 0 on the right-hand box $\boxed{4} \boxed{0}$. It would mean 4 bundles in the left-hand box and no pencils at all in the right-hand.

Now that we have got so far, perhaps we can manage without the boxes at all, and simply remember that we write the figure for the bundles *on the left-hand side* and the figure for the loose pencils *on the right-hand side*.

The first set of pencils we counted will have the figures written like this: 22. The second set will be 35.

And they mean just the same as they did when the boxes were there. When we write 22, the 2 on the left means 2 bundles of ten, and the 2 on the right means 2 loose pencils. When we write 35, the 3 means 3 bundles of ten (because it is the *left-hand* figure), and the 5 means 5 loose pencils.

Perhaps you are thinking by this time that we still have not learned the *names* of any numbers bigger than twelve. Never mind; we are getting near it now. Suppose you have six of the cards which you use for playing "Snap," and you then get six more given you. How many have you altogether?



Six you have at first.

Six you have given you.

Of course, you know that at once. Twelve cards. It is the same thing as counting the crows and owls; six crows and six owls made twelve birds altogether. Now we will count the

cards in the same way that we counted the pencils.



These make a bundle of ten, and leave two loose cards.

You see, we can make one bundle of ten cards, and we have two loose cards left. The figures to put on the boxes would be [1] [2], or, since we said we could do without the boxes at all, we have only to write 12.

Now we understand why we said in Lesson 3 that we should find 12 stood for *twelve*. It is because the 1, the *left-hand* figure, means one bundle of ten things, and the 2, the *right-hand* figure, means two more things.

In the same way, if you have eleven cards, you get *one* bundle of ten and *one* card left, so that the figures to put on the boxes are 1 and 1, and thus 11 stands for eleven.

If you have only ten cards, there are no cards left to put into the right-hand box; which tells us that the figures which stand for ten are 10.

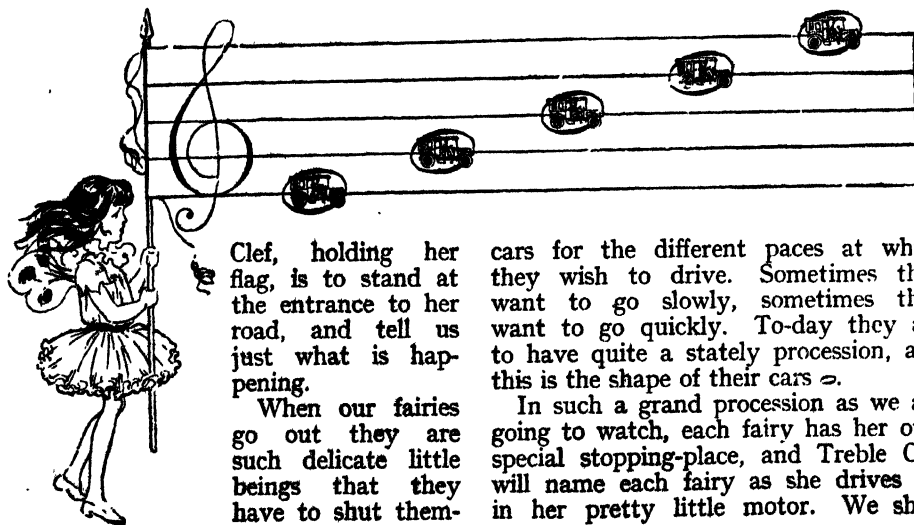
Next time we shall learn the *names* of the figures after twelve.

THE PROCESSION IN TREBLE ROAD

OUR little fairy guide, Treble Clef, has a very busy day before her. The fairies are going to have a procession. They are coming in their little motor-cars down the Treble Road, and Treble

selves safely in their wee motors, so that the sun shall not scorch them or the wind blow them away. And so we see the cars, but not our fairies.

The fairies have different sorts of



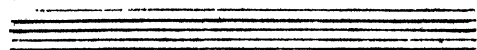
Clef, holding her flag, is to stand at the entrance to her road, and tell us just what is happening.

When our fairies go out they are such delicate little beings that they have to shut them-

cars for the different paces at which they wish to drive. Sometimes they want to go slowly, sometimes they want to go quickly. To-day they are to have quite a stately procession, and this is the shape of their cars.

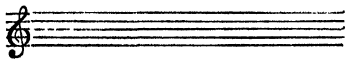
In such a grand procession as we are going to watch, each fairy has her own special stopping-place, and Treble Clef will name each fairy as she drives up in her pretty little motor. We shall

see where each one stops. We found there were five motor-lines, did we not? Just like this:



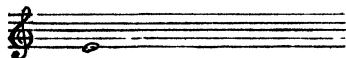
The five motor-lines

which the fairies call a staff, and these are the lines our fairies are using to-day. There is a little movement, quite a gentle stir, for fairies tread daintily, and Treble Clef is in her place, looking very important, and beckoning to you and to me to watch very carefully so that we may see everything that is going to happen.



Treble Road

Hark! A gentle, buzzing noise, like the whirr of insects' wings, tells us the first fairy car has arrived.



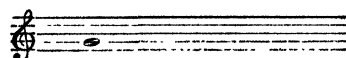
This is Fairy E's motor

Treble Clef cannot talk loudly to us now, because she is on duty; but, in a whisper which we hear quite clearly, she says:

"This is Fairy E's car. She is inside, and now she has stopped on the first motor-line." We must go to the piano, and find that house of hers which is very near the middle of the black and white line. It is the second white door from Fairy C's middle house. Press the door very gently, and you will hear Fairy E sing:

Fairy E's motor on first line does stay,
So this is where you find her to-day.

Another little flutter, and a second motor-car arrives and stops on the second line:



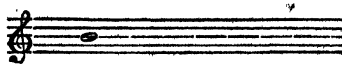
This is Fairy G's motor

"Behold Fairy G's car!" whispers Treble Clef. Go to the piano, and find her house, next door but one to where we have just found Fairy E. Press the door very gently, and listen to Fairy G's voice:

The sun is bright, the weather fine,
G's motor stops on the second line.

Still another rustle, like a murmuring breeze, and Fairy B's car arrives.

She goes on till she reaches the third line:



This is Fairy B's motor

Treble Clef tells us to go to the piano and find Fairy B's house, next door but one to Fairy G. Press this door, and hear Fairy B answer:

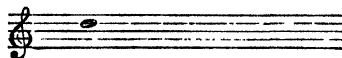
'Tis quite the right door, how clever you are!
On line number three stops Fairy B's car.

Tinkle, tinkle, tinkle! Another fairy has arrived.

"Fairy D is coming to take her place on the fourth line," says Treble Clef in her gentle whisper.

Off we run to the piano and find Fairy D's house, the next door but one to where we heard Fairy B speak. Directly we press the door, Fairy D sings:

When Fairy D's coach stops at line number four,
You may rest content that this is her door.

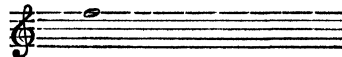


This is Fairy D's motor

Again there is a rustle, gentle as a butterfly's kiss, and Treble Clef's voice again is heard. "Here comes Fairy F's motor, to take her place on the fifth line."

Once more we must go to the piano, find Fairy F's house, the next door but one to where we have just found Fairy D, and, pressing the door very gently, we hear Fairy F's sweet song:

In the wide, wide world I never need roam,
For line number five is Fairy F's home.



This is Fairy F's motor

Then the birds sing, the bluebells ring, the trees shimmer in the breeze, all for pure gladness of heart, for, now a fairy car has stopped on each line of the Treble Road, birds, flowers, and trees know the fairies will sing a merry rhyme for boys and girls to remember:

Five little fairies bright as the day,
What do we want but a game of play?
Five little fairies in motor-cars,
Five little motors, five little bars.
E on the first line, G number two,
B on the third line, going so true.
D on the fourth line, F number five.
Dear little fairies, bright and alive.

Next time we shall hear about the meeting on Bass Road.

LITTLE PICTURE-STORIES IN FRENCH

OUR story this time, which is continued from page 748, tells us how the party make their way to the boat. Remember that the first line under each picture is the French, the second gives the English word for the French word above it, and the third line shows how we make up the words into our own language.

Il est presque une heure.
It is nearly one hour.
It is nearly one o'clock.

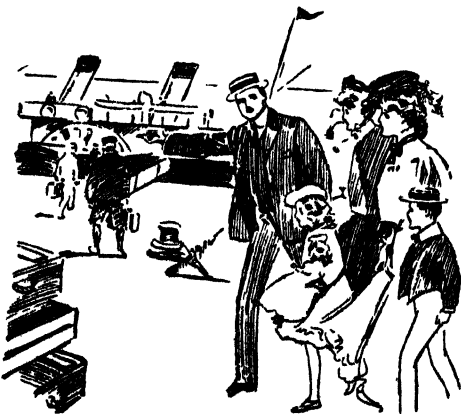
Le bateau va bientôt partir.
The boat goes soon to start.
The boat will soon start.



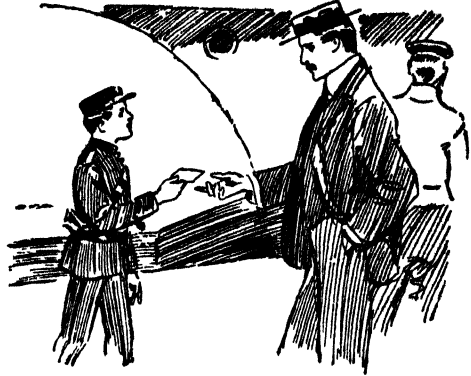
Il y a beaucoup de voyageurs.
It there has many of travelers.
There are many travelers.

Tout le monde se dépêche.
All the world itself hurries.
Everyone is hurrying.

Nous courons vers le bateau.
We run towards the boat.
We run towards the boat.



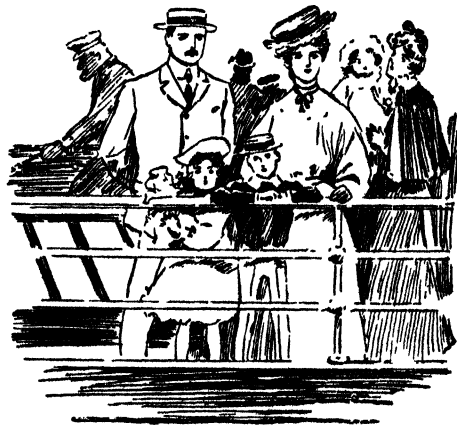
On crie : " Monsieur Hawes ! "
One cries : " Mr. Hawes ! "
Someone calls : " Mr. Hawes ! "



C'est un télégramme pour papa.
It is a telegram for papa.
It is a telegram for papa.

Papa l'ouvre ; c'est de notre oncle.
Papa it opens ; it is from our uncle.
Papa opens it ; it is from our uncle.

Il nous souhaite bon voyage.
He to us wishes good journey.
He wishes us a good journey.



Nous sommes enfin sur le bateau.
We are at last on the boat.
At last we are on the boat.

C'est un grand bateau à vapeur.
It is a large boat to steam.
 It is a large steamer.



Le pont est rempli de bagages.
The deck is filled of luggage.
 The deck is covered with luggage.

Papa s'occupe des nôtres.
Papa himself busies of ours.
 Papa looks after ours.

Une vieille dame nous fait rire.
An old lady us makes to laugh.
 An old lady makes us laugh.

Elle a perdu son perroquet.
She has lost her parrot.
 She has lost her parrot.

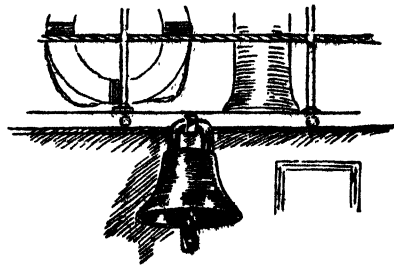


La bonne aperçoit la cage.
The nurse sees the cage.
 Nurse sees the cage.



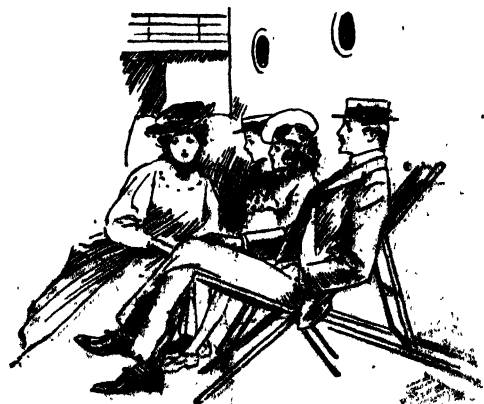
La dame est enchantée.
The lady is delighted.
 The lady is delighted.

C'est un bruit épouvantable !
It is a noise frightful !
 There is a frightful noise !



La cloche sonne. Nous allons partir.
The bell rings. We go to start.
 The bell rings. We are going to start.

Nous nous asseyons sur le pont.
We ourselves sit on the deck.
 We sit on the deck.



THE NEXT SCHOOL LESSONS ARE ON PAGE 1431.

The Book of THE UNITED STATES

THE HISTORY OF THE UNITED STATES

WE learned in our last story of the United States, how the English and the colonists together drove the French out of North America. Only a few years later these same colonists rose against the English and said that England should no longer rule them. The war known as the Revolution followed, and after seven years the colonists, helped by the French, compelled England to agree that the thirteen colonies were to be independent states in the future. We shall learn in these pages of the reasons for the Revolution, and shall be told how the few colonists were able to contend so long against the mother country, in spite of great difficulties and hardships. Finally, as we shall see, England grew tired of the vain struggle, and the way was open for the birth of a new nation, which has grown into the present United States of America.

THE REVOLUTION

THE English and the colonists fought side by side against France and succeeded in forcing that nation, in 1763, to give up all its lands in North America either to England or to Spain. Only a few years afterwards the colonists were fighting against the English, and the French were helping the colonists. How did these changes come about?

The whole story of these changes is very long and hard to understand because one must know so many other things first, but the principal reason the colonists fought England was on account of taxes, though that is not the only reason. The French helped the colonists because they thought they could in this way punish the English for the loss of their possessions in North America, and yet this is not the only reason either. Nearly always when a nation or a person follows some particular policy or plan, it is for more than one reason. You have heard many times some one say that he did something because of this, and of that and of the other reason.

THE EUROPEAN IDEA OF THE USE OF COLONIES

The trouble which finally led to the Revolution began, in fact, when the different colonies were first

CONTINUED FROM 966

planted. All the countries of Europe thought that the only reason a colony had for existing at all was to help the mother country. No matter how much any rule or law hurt the colony, the old country thought it a good one if it helped it even a little bit. Though the colonists were of the same blood as their relatives who remained in the old country, somehow they were supposed to be inferior to those who had stayed at home, and to have no real rights. We find in the history of colonies in America and elsewhere, many stories which show how the old countries looked down on the new. You remember how General Braddock said that the Indians might defeat the "raw militia" but that they could make "no impression on the King's Regulars."

HOW A COLONY MIGHT HELP THE MOTHER COUNTRY

Now there were three ways by which a colony might be of use to the mother country. First, by supplying the precious metals, such as gold and silver; the second, by buying the goods of the old country; and the third, by furnishing those goods which could not be grown or made in the old country.

Only the Spanish colonies in Amer-

Copyright, 1910, 1918, by M. Perry Mills.

ica furnished gold and silver, and they were really more like armed garrisons than colonies. The English and the French colonists found little or no gold or silver, though they wasted much precious time looking for them. The French colonies in Canada supplied many valuable furs and the English colonies also hunted animals for their fur. The English colonies, however, could grow several articles such as tobacco, rice, indigo, pine trees for masts for ships, which England wanted very much. Then too, they could furnish large quantities of tar and pitch, which were also valuable in building and repairing ships.

TRADE ONCE THOUGHT A GAMBLE IN WHICH ONE SIDE MUST LOSE

Now we must also think about some strange ideas that people of that time had about trade. They thought that trade was like gambling in which one side must lose. Now we know that there is such a thing as fair trade, in which both parties may gain. To make this clear let us go back to the days when there was no such thing as money and see how people could get the things which they did not or could not easily get by their own labor.

Suppose that one man was a good fisherman, and another had learned how to make very quickly the sandals or moccasins which people wore on their feet. Now if the fisherman wanted to make a pair of sandals, he had to find a piece of skin suitable for the purpose, then had to prepare it and then cut out and sew together the pieces. All of these processes would take a great deal of time. If the sandal-maker attempted to catch fish for himself he was forced to get ready hooks and lines or nets, make or rent a boat or else sit on the bank and try to get fish. In the time that it would take him to catch fish enough for his family he might be able to make several pairs of sandals.

Would not both men be better off if the fisherman should give some of the fish he caught for a pair of sandals? Each would be doing the thing which he could do best, and each would profit by doing that and by not trying to do something which he could not do well. This idea is called the "Division of Labor" and is just as true after

money appears and the fisherman sells the fish he does not need for his family and buys a pair of sandals with money.

THE EUROPEAN COUNTRIES MAKE LAWS TO CRIPPLE THE COLONIES

A hundred and fifty years ago very few men understood the truth that both parties in a trade could gain, and none who did understand it had any part in making laws. So the nations which had colonies made laws which were intended to prevent the mother country from losing in trade with her colonies. The result was often that both parties lost.

England began to make such laws soon after the first colonies were planted in America and continued to make others. No American colony could send rice, indigo, tobacco and certain other articles to any country except England, and they must be carried in an English or a colonial ship. The colonists were not allowed to buy their goods from any nation except England. So you see that if France wanted some article produced in the colonies, and the colonists wanted some French article in exchange, the French must first sell what they had to English merchants and then buy from them the colonial goods they wished. In this way you can see that the English merchant made two profits and the English or colonial ship-owner was paid for carrying the goods to and from America.

But this was not all. As the colonies advanced some began to manufacture some articles from iron, and to make hats, cloth and a few other things, thus shutting off a part of the British market. So laws were passed forbidding the colonists to manufacture certain goods. They must send their wool to England to be made into cloth, and their iron to be made into pots or ploughs. When the colonists began to raise more grain than they needed they were not allowed to send any to England unless a tax on every bushel was paid, for the English farmer thought that he would be injured if American wheat was imported.

THE COLONISTS PAY NO ATTENTION TO THE LAWS

At first these laws made very little difference to the colonists because they were not enforced. The colonists traded wherever they pleased, and

though they were forbidden to send ships to other British colonies, they did so whenever they pleased. There were three reasons for England's neglect. She was busy much of the time with wars in Europe; at first the colonial trade amounted to very little; and then she was afraid that if the colonists were annoyed very much they would make friends with the French who claimed such a large part of North America. One of the English ministers said that the colonists paid in taxes on goods brought in only \$10,000, and that it cost \$40,000 to collect this sum.

But about 1760, the English government showed a new spirit. George III came to the English throne and he was determined to be king in fact as well as in name. His grandfather and great-grandfather had both been born in Germany, and never really felt at home in England. Because they could not speak English well they had had very little to do with the government, and gradually a few powerful families had come to be the real rulers of the country. George III was determined to change all this. He intended to bring all the parts of the British Empire under the same regulations.

FRENCH AND INDIAN WAR REALLY THE BEGINNING OF THE REVOLUTION

Another reason was that the French and Indian War, then being fought, was going against the French and it was believed that the French would soon be driven out. But all through the war the British felt that the colonists did much less than they should have done. Each colony was jealous of every other. There was no central government and each colony did as much or as little as it pleased toward the common defence.

On the other hand the colonists had fought by the side of regular troops and had done as well or better in many battles. They began to have more confidence in themselves and to think of themselves as a part of the British Empire, not as under the British Empire. They acknowledged George III as their king but began to say that Parliament had no right to make laws for them, but that the legislature of each colony was the little Parliament of that colony.

The British government after the

French and Indian War decided to keep an army in the colonies and to appoint and pay the judges, as it was felt that the judges appointed or elected by the colonists themselves decided too often against the British merchants or officers. It was also decided to make the colonists pay a part of the cost. This seemed fair to the English as the French and the Indians had been much dreaded by the colonists.

THE STAMP ACT AROUSES THE COLONISTS TO RESISTANCE

Several new laws about taxes were made, but that known as the Stamp Act was most disliked. It was passed by the British Parliament in 1765. According to this act all law papers such as wills, deeds, appointments to office, licenses to sell liquors of any kind, charters, mortgages, and the like must be written on stamped paper, each sheet of which cost from six cents to fifty dollars. Every newspaper or pamphlet and every almanac must also be printed on stamped paper of a cheaper kind. Every advertisement and every package of cards also had to pay a stamp tax. It was thought that the tax would amount to about a half million dollars a year. Such taxes were paid in England and very few people there seem to have had any idea that the colonists would object very much.

This law did not seem very hard to England. She had not been harsh toward her colonies. All the European nations treated their colonies much more severely than she had done. But England had left the colonies alone too long. They had grown to believe, as we said above, that Parliament had no right to lay any tax on them as they had no voice in Parliament. There was great excitement in every colony and the people determined to resist. In several colonies secret societies called "Sons of Liberty" were formed to resist the officers.

Another thing which made the colonists angry was an order that the western lands, which had been won from the French, should not be settled at that time. The colonies thought that these lands belonged to them, and were not willing to give them up. Then, too, they felt that prices of everything they bought would be higher because of the new taxes they were to pay.

THE COLONISTS DECIDE TO BUY NO GOODS FROM GREAT BRITAIN

Many people agreed to buy no British goods. In some towns men in charge of the stamps were beaten and ordered to resign. If they refused, their houses were burned and they were threatened with hanging. Many boxes of stamps were burned by the mobs, and some

had forgotten that the colonists were Englishmen, and the English people had settled once for all when they cut off the head of Charles I that they would not be taxed without the consent of their representatives. Some Englishmen said that every member of Parliament represented everybody in the whole British possessions, but the colo-



This quaint picture of the Boston Massacre was made from a very rare old print engraved by Paul Revere, who carried the news of the British march on Lexington and Concord to the farmers along the road. We must confess that Revere, who was a goldsmith in Boston, was more successful as a messenger than as an artist. He became a prominent citizen of Boston, grew rich and had great influence in politics. Some of the houses shown in the picture are still standing in Boston to-day.

of the leading men elected from most of the colonies drew up a paper saying that there ought to be "no taxation without representation." In only two colonies were any stamps used, and not many were used in these.

The English people were astonished at the anger of the Americans. They themselves paid stamp taxes, heavier than were charged the colonists. But they

nists said that a man could not represent a country in which he did not live.

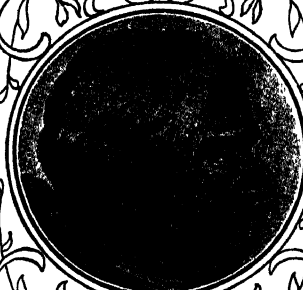
THE STAMP ACT REPEALED BUT OTHER TAXES PUT IN ITS PLACE

Parliament repealed the Stamp Act in 1766 but still declared that it had the right to pass any laws it pleased for America. The next year an act was passed placing taxes on all tea, glass, lead, paints and a few other

FOREIGN FRIENDS AND FOES



LAFAYETTE



ROCHAMBEAU



STEBEN



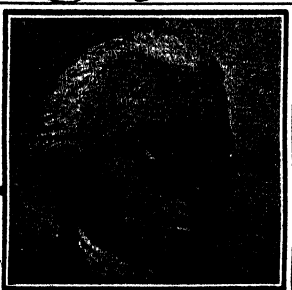
KOSCIUSZKO



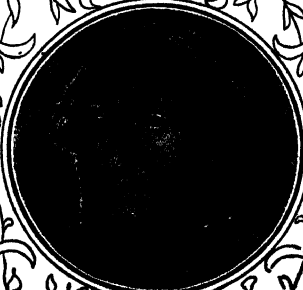
BURGOYNE



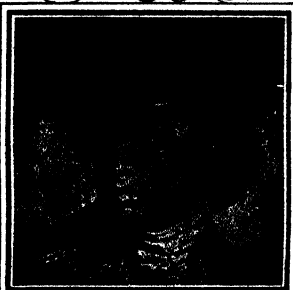
HOWE



CLINTON



CORNWALLIS



TARLETON

Lafayette and Rochambeau were brave Frenchmen who fought for us. Baron Steuben, a brave German officer, and Kosciuszko, a gallant Pole, also helped the American cause. General Burgoyne surrendered at Saratoga in 1777, while General Howe and Sir Henry Clinton found conquering America was hard work, and Lord Cornwallis surrendered his entire army. Tarleton was a cruel British cavalry leader.

articles brought into the colonies. The money was to be used to pay the salaries of governors, judges, and other officers. The colonists had had some power over their officers before this time, for, if they had felt that the governors were wrong, they had refused to pay their salaries. This act would make all officers servants of the king instead of the people.

The colonists determined to resist. First they agreed to buy none of the taxed articles, and the legislatures began to talk about resisting by force. The governors of some colonies ordered the members of the legislatures to go home. In Boston there were several riots and in 1768 the King sent some soldiers there. The soldiers and the people were constantly quarreling. In March, 1770, a few soldiers fired upon a mob which was throwing stones and snowballs at them, and killed four and wounded seven. This was called the "Boston Massacre." We show you a picture of it, from a rare old engraving made at the time by Paul Revere, whom we shall hear about in another place.

WHAT DOCTOR JOHNSON THOUGHT ABOUT AMERICAN RIGHTS

The merchants of London were all this time losing much money because the colonists refused to buy their goods, and many other men wished Parliament to stop trying to tax America. George III, however, was almost insane on the subject, and said that any man who thought such a thing was an enemy of his country, and he made Lord North, who was the chief minister, do as he said. Doctor Samuel Johnson, the author, about whom you can read in another part of our book, said that the Americans "ought to be thankful for anything we allow them short of hanging."

Parliament, only a few weeks after the "Boston Massacre," took off the tax on all articles except tea, but a tax of six cents a pound was left on that popular drink. The colonies were not satisfied. They objected to paying the tax. In North Carolina some of the inhabitants who said that they were unjustly taxed, called themselves Regulators, and drove out some judges. They were defeated on Alamance Creek in 1771 by troops under the royal governor, William Tryon, and about two

hundred were killed or wounded. Many others crossed the mountains into the territory which afterwards became Tennessee and Kentucky.

THE BOSTON TEA PARTY SHOWS WHAT MIGHT FOLLOW

Still the colonists refused to buy tea from England and brought in tea from Holland which paid no duty at all. So the English tried a trick. Always before this time the tea sent to America had passed through some British port and had paid there a tax of a shilling. Now the tea intended for sale in America was no longer to pay this tax in England, and in America only the six cent tax was to be paid. In this way the American would get his tea much cheaper than the Englishman could get his. It was thought that the Americans would buy this tea, since they could get it cheaper than any other, and therefore pay the tax. Ships loaded with tea were sent in 1773 to Charleston, Philadelphia, New York and Boston. At Philadelphia and New York, the tea-ships were sent back. In Charleston the tea was stored in damp cellars where it soon spoiled. In Boston a party of men disguised as Indians boarded the ships one night and emptied the tea into the bay. This was the "Boston Tea Party."

The English government now determined to punish these deeds. Even those members of Parliament who had been friendly to the colonists thought that they had gone too far. Several very strict laws were passed, and the port of Boston was closed to ships. An army officer, General Thomas Gage, was put in charge, with the hope that Massachusetts would be starved and the other colonies would be so frightened that they would submit at once.

The result was not what the British expected. The other colonies sent food to Boston by land and Massachusetts refused to pay any taxes to General Gage's government. The colonies, except Georgia, elected delegates who met in Philadelphia in September, 1774, and called themselves a Continental Congress. This body sent a letter to England telling of their wrongs. Then it published a "Declaration of Rights" in which all the rights of British citizens were claimed, and finally agreed to recommend that the people should buy

no British goods until the colonies were treated better.

THE COLONIES PROPOSE TO RESIST BY FORCE

The different colonies at once began to organize troops and to collect weapons, powder and bullets. General Gage heard that a large quantity was stored in the little village of Concord, near Boston, and on the night of April 18, 1775, troops left Boston to capture or destroy these stores and to arrest

Seven were killed and nine wounded. As they were too few to offer battle they scattered in every direction. The Revolutionary War had begun.

After the Americans were dispersed, the British marched on seven miles to Concord, only to find that most of the stores had been removed and that other bands of stubborn farmers were on the ground. Here sharp fighting followed and the British troops were forced to begin a retreat. At Concord Bridge



You read of the Battle of Lexington and Concord on April 19, 1775, in the text. Here you see how the Massachusetts farmers, young and old, rushed to arms, and almost without leaders fired at the British from behind trees and walls until the soldiers were forced to run for their lives. Only the arrival of reinforcements saved all of them from capture. This battle had great influence in making people decide to resist.

two leading patriots, John Hancock and Samuel Adams, who were then at Lexington. But some of the Boston people were watching the soldiers very closely and Paul Revere, a Boston goldsmith, and others galloped ahead and warned the people. Perhaps you have read Longfellow's poem, which tells of Paul Revere's ride, which stirs the blood, though it is not quite accurate.

When the troops reached Lexington they found a little band of farmers drawn up on the village green. The British commander, Major Pitcairn, ordered them to disperse. They did not move until they were fired upon.

the contest was hardest. Ralph Waldo Emerson has written a poem about the fight which you may find on another page. The British did not retreat a moment too soon. The news of the encounter at Lexington had spread like wildfire throughout the country, and the farmers with their trusty rifles came swarming from every direction like angry bees around the troops.

THE RETREAT OF THE BRITISH FROM CONCORD AND LEXINGTON

From behind walls, trees and fences, the bands of minutemen fired upon the retreating troops, and then hurried by short-cuts across the fields to fire again.

The retreat became a rout and the whole force would have been destroyed or captured if reinforcements from Boston had not come out to meet the weary soldiers who had marched all day and who had had nothing to eat for fourteen hours. During the day the British lost nearly 300 men while the American loss was less than 100 all told.

The news that war had begun spread rapidly, when we consider that none of our modern methods of scattering information were in existence. There were no telegraphs or telephones, no railroads or steamboats; but riders with swift horses told the story. From all New England, men hurried to Boston. Benedict Arnold and Israel Putnam led volunteers from Connecticut and John Stark came down from New Hampshire. Putnam is said to have left his oxen hitched to the plough. Soon 16,000 men were besieging Boston. On the 10th of May the forts at Ticonderoga and Crown Point were taken by the Green Mountain Boys under Ethan Allen and Seth Warner, and a large supply of powder and many cannon were taken. Some of these guns were later taken to Boston to be used against the British there.

THE MECKLENBURG DECLARATION OF INDEPENDENCE

When the news reached North Carolina late in May, the inhabitants of Mecklenburg County assembled at Charlotte and took the bold step of declaring themselves independent of Great Britain. The royal governor, before he fled to the protection of a British war vessel at Wilmington, called the resolutions the "most horrid and treasonable publications yet issued in America."

The troops around Boston determined to fortify the high ground overlooking the city, and on the night of June 16th began to throw up earthworks on Breed's Hill. The next day the British attacked, and were twice driven back, with the loss of 1,000 men, but the third assault was successful as the Americans had used all their powder. This was the battle of Bunker Hill, as that was the hill the troops had been expected to fortify.

GEORGE WASHINGTON MADE COMMANDER-IN-CHIEF OF THE ARMY

Meanwhile the delegates from the different colonies, calling themselves the

Second Continental Congress, had met at Philadelphia and voted to raise an army. The Virginian of whom we have heard before was chosen to lead. On the 3rd of July, 1775, George Washington, standing under a great elm at Cambridge, took command of the raw troops and at once began to drill and organize an army.

In spite of these battles the American people as a whole were not yet ready to separate from England. They claimed that they were not fighting against England but against the bad advisers of the King, and Congress sent another petition to him, which he refused to read. Almost immediately he hired about 20,000 troops from the rulers of some small German states. One of these states was Hesse-Cassel and therefore these troops were generally called Hessians. They were much hated by the Americans but the men themselves were not to blame. In their own country they were little better than slaves, and could not disobey their ruler, who received so much a head for them.

With Washington at Cambridge were many men who became famous in the war which was to follow, among them Benedict Arnold, Daniel Morgan, John Stark, Nathanael Greene, Israel Putnam and Philip Schuyler. Two others, Horatio Gates and Charles Lee, for a time were much valued but proved failures in the end. All these set to work to make an army, for a mob which has not been drilled or disciplined is not an army though it may accomplish great things while the enthusiasm lasts.

THE UNSUCCESSFUL ATTACK ON CANADA FOLLOWS

Congress decided to try to capture Canada. General Montgomery took Montreal on November 12, 1775, and the next day Benedict Arnold appeared before Quebec. Later he was joined by Montgomery and on the last night of the year they attacked the town, but Montgomery was killed, Arnold severely wounded, and a part of the army was captured. The Britons soon sent more troops and the Americans were forced to retreat. But while the American soldiers were meeting with failure here, Washington was able to force the British to give up Boston, where they were obliged to leave many valuable military stores. Washington then moved to New

AMERICAN REVOLUTIONARY GENERALS



PUTNAM



SCHUYLER



MARION



WAYNE



GREENE



MORGAN

Here are six of the leading Revolutionary generals. Israel Putnam was a brave Connecticut farmer, who fought all through the war. Philip Schuyler was about to capture Burgoyne when Gates was unjustly put in his place. Wayne was sometimes called "Mad Anthony," because of his bravery in battle, while Francis Marion was called the "Swamp Fox," as the British could not catch him. Daniel Morgan was a good officer, and, next to Washington, Nathaniel Greene was the best American general.

York, which he knew would be soon attacked.

WHAT THE WORDS WHIG AND TORY MEANT DURING THE REVOLUTION

The feeling that the colonies must be independent was growing fast, but in almost every colony there was a strong party which wished to remain under English rule. These people were called Tories, while the independence party took the name Whig. In North Carolina, 1,600 Scotchmen, recently arrived in the colony, marched toward Wilmington to join Sir Henry Clinton. They were met at Moore's Creek, February 27, 1776, by about 1,000 Whigs and put to rout. Among the prisoners was Allan Macdonald, the husband of the famous Flora Macdonald, who had helped the Young Pretender to escape. Sir Henry Clinton was so much discouraged by the battle that he did not try to take Wilmington but sailed on to Charleston. There a rude fort had been built of palmetto logs, and the guns of the fleet did little harm, while the ships were badly shattered.

A PAPER WHICH HAS CHANGED THE HISTORY OF THE WORLD

Soon after Moore's Creek, North Carolina voted for complete independence, and other states soon followed. The royal governors had been driven out and elected ones put in their places. On the 7th of June, 1776, Richard Henry Lee, of Virginia, moved in Congress, "That these United Colonies are, and of a right ought to be, free and independent states." The question was discussed for several weeks, for many good men had not yet given up hope that England and the colonies might somehow agree. Finally, on July 2nd, twelve colonies voted for independence and began to discuss the words in which they were to publish what they were going to do. On July 4, 1776,—a date all Americans must remember,—the Declaration of Independence, written by Thomas Jefferson, was agreed upon. We shall not stop here to say much about this paper which declared that the colonists would no longer be subject to England for we hope to tell more about it in another place.

You are sometimes told that the Declaration of Independence was signed upon July 4, 1776. This is not quite

true. It was agreed upon on that date but it was not signed until much later, after a copy had been made upon parchment. Some men who had voted for it were not present when the copy was finished and did not sign until months afterward. One man, who helped to draw up the paper, never signed it.

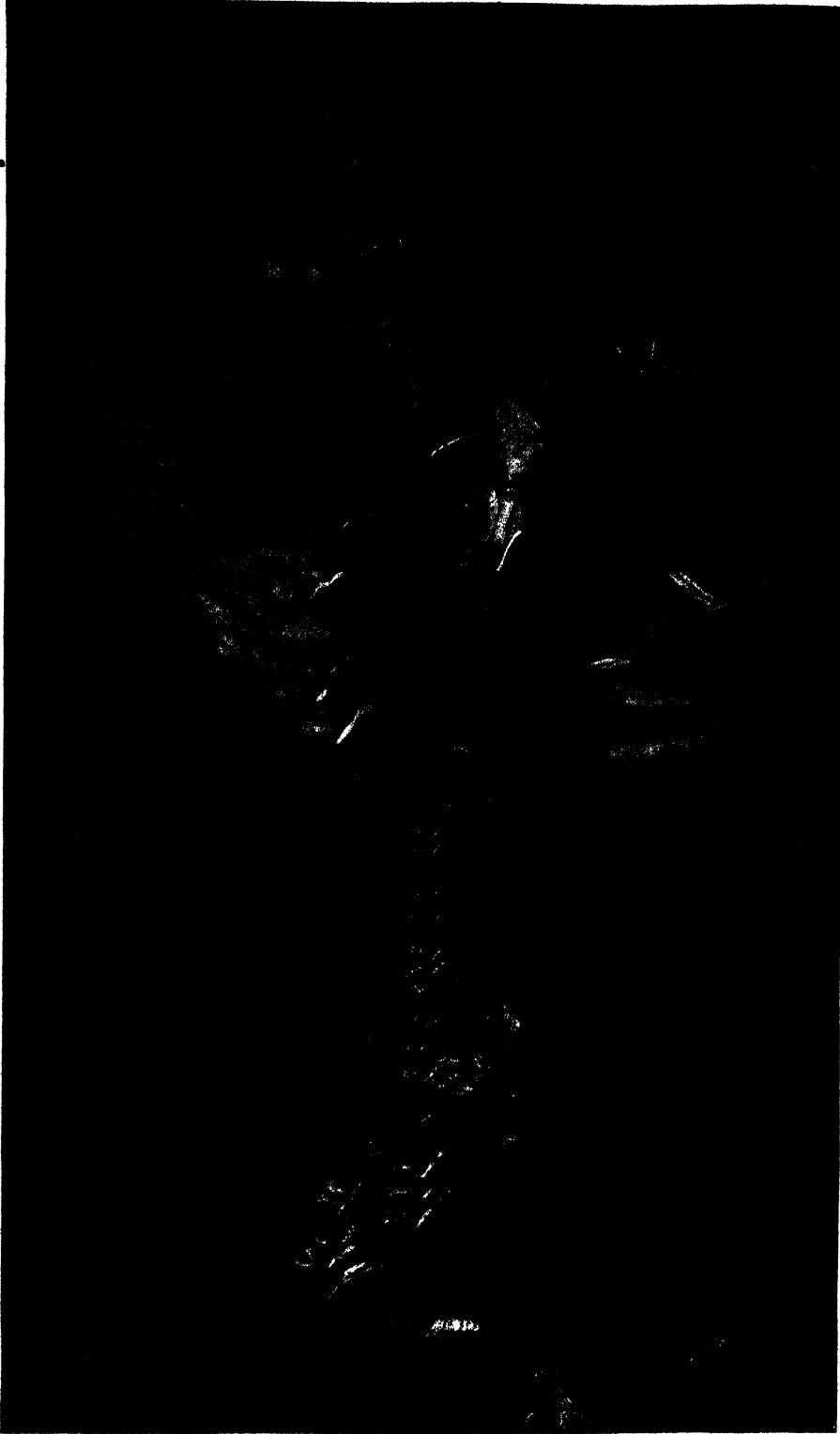
Everywhere the news was received with joy. Bells were rung, bonfires were lighted and people marched in torchlight processions. In New York a leaden statue of George III stood in the little park called Bowling Green. This the people pulled down and sent to Connecticut to be made into bullets. In other places everything which reminded the people of English rule was torn down.

THE BRITISH PLAN TO DIVIDE THE COLONIES

The war was now begun in earnest. We cannot describe all the battles but shall tell of the most important. The first plan of the British was to gain control of the Hudson River. In this way New England would be cut off from the other colonies and it was thought that success would be easier. One army was to move down from Canada while another under Lord Howe was to capture New York City, then held by Washington. The Canadian army was driven back by Benedict Arnold, but the other was more successful.

General William Howe and his brother, Lord Howe, who commanded the British fleet, had many more men than Washington and hoped to capture the soldiers stationed on Long Island. The American troops were badly defeated in the battle but the night of August 29, 1776, was dark and foggy. Washington crossed over the East River and escaped without losing a man. He then marched to the northern part of Manhattan Island and camped about where the College of the City of New York stands. Howe followed but was defeated in a battle on Harlem Heights near where Columbia University now stands. In order to escape being surrounded, Washington was forced to retreat from Manhattan Island. At White Plains, Howe gained some advantage on October 29th and on November 16th captured Fort Mifflin on the Hudson River and took 3,000 prisoners.

THE DECLARATION OF INDEPENDENCE BEFORE CONGRESS



John Trumbull, a Revolutionary soldier, who had been Washington's secretary, after the war went to London to study painting. On his return he painted the portraits of many men prominent in the struggle. The original of this picture is in the Capitol at Washington. The man in the chair is John Hancock, President of Congress. The five men standing before him are the Committee to draw up the Declaration, Benjamin Franklin, Thomas Jefferson, Robert Livingston, Roger Sherman and John Adams.

WASHINGTON IS FORCED TO RETREAT ACROSS NEW JERSEY

Washington feared that Howe intended to march on to Philadelphia, and crossed over into New Jersey. Nearly half of his army was still on the New York side, under General Charles Lee, who was ordered to cross into New Jersey also, but that officer, who was jealous of Washington, and thought that he himself ought to be commander-in-chief, did not obey promptly and Washington was forced to retreat across New Jersey into Pennsylvania. When Lee did cross, he was captured through his own carelessness but his little army joined Washington. On Christmas night, Washington, with 2,500 men, recrossed the Delaware River, then filled with floating ice, and captured 1,000 prisoners at Trenton.

The British had begun to think that the war was over and it is said that some of the officers had sent their baggage on board ship at New York, expecting to return to England. But when the news of this sudden stroke came, the British officers hurried back to New Jersey, only to have a part of their forces surprised and defeated at Princeton, a little more than a week after the defeat of Trenton. Washington was not able to risk a battle with the whole British army and soon withdrew into the hills around Morristown, where the British were afraid to attack him.

AMERICAN SUCCESS LEADS TO HELP FROM FRANCE

The result of the first year of the war was on the whole favorable to the Americans. Though New York had been lost, and Fort Washington captured, and though the American army had been defeated at Long Island and at White Plains, it had been proved that the American soldiers were a match for an equal number of British. Washington had shown military ability which surprised Europe, and the British began to be afraid of him and some wished to give up the war. France became interested and began to loan money. Some French officers came over to fight in the American army. Among these was the Marquis de Lafayette, whom Washington afterward came to love like a son. He was only a boy when he arrived, but soon became a good soldier.

THE BRITISH AGAIN PLAN TO CUT THE COLONIES IN TWO

The British still intended to cut the colonies in two by capturing the Hudson River. So the plan for 1777 was for an army under General John Burgoyne to march down from Canada along Lake Champlain toward Albany. Another was to start from Lake Ontario, move down through the Mohawk Valley, stir up the Tories and the Six Nations and finally join Burgoyne. The third army, under Howe, was to march up the Hudson from New York to Albany. General Philip Schuyler, the American commander, had a very small force at first, and was not able to fight Burgoyne, but as he retreated, he cut down trees, broke down bridges, and made the roads so bad that Burgoyne spent twenty days in moving twenty miles. Some Indians joined the British, but few Tories came, and the Indians did more harm than good, for their cruelty stirred up the Americans to join Schuyler. Burgoyne sent a party of Hessians to capture some military supplies the Americans had collected at Bennington, Vermont, but General John Stark defeated the British force and took 600 prisoners. The other British army, which had been expected to come from Lake Ontario to arouse the Tories and Indians and then join Burgoyne, was defeated at the battle of Oriskany, near Fort Stanwix. The Indians left the British and all retreated.

Just when Schuyler's army had grown large enough to attack Burgoyne, his enemies in Congress succeeded in having General Horatio Gates put in his place. On the 19th of September and on the 7th of October, 1777, two bloody battles were fought near Saratoga and were won by the Americans, largely through the efforts of Schuyler, Arnold and Morgan, though, of course, Gates got the credit. Burgoyne surrendered his whole army on the 17th of October, as Howe had sent no help.

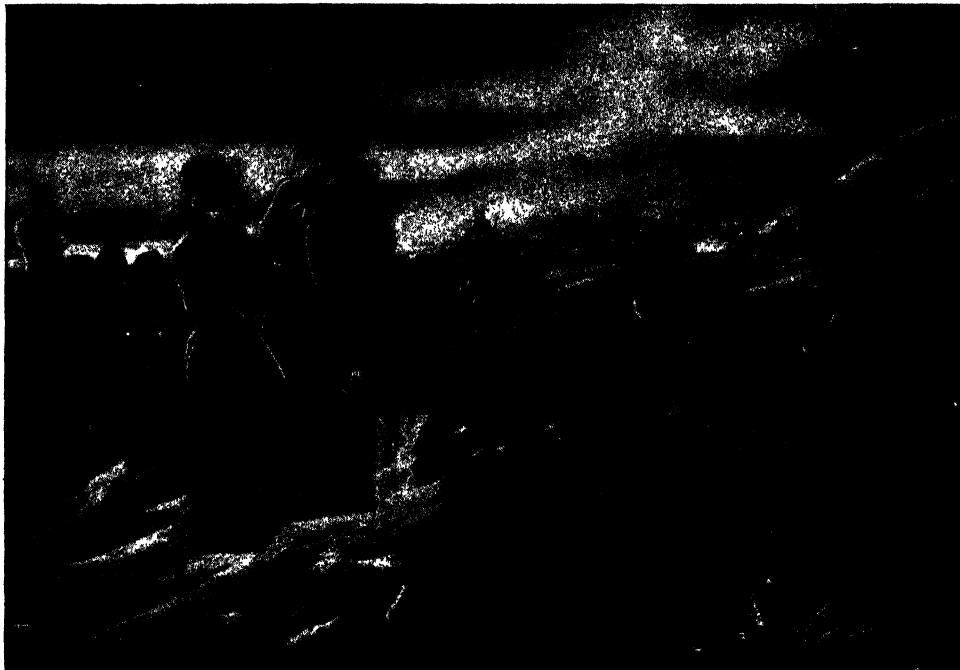
THE BATTLES OF BRANDYWINE AND GERMANTOWN

Howe had made the mistake of trying to take Philadelphia before going to the aid of Burgoyne. Washington opposed him at Brandywine Creek, September 11th, and though defeated, delayed the British for some time, and three weeks later only a fog prevented

HARDSHIPS OF THE REVOLUTION



On Christmas night, 1776, Washington crossed the Delaware River with 2,500 men, and surprised a force of Hessian troops at Trenton, New Jersey, capturing 1,000 of them. The weather was so cold that the Hessians thought no army could move. Our picture was made from the painting by Leutze, now in the Metropolitan Museum, New York City. It is a spirited picture even if the boat is overloaded.



Valley Forge is a village near Philadelphia. Here Washington's army spent the winter of 1777-78, suffering much from cold, hunger, and lack of proper clothing. Here we see Washington and Lafayette, tramping through the snow, inspecting the defences, and cheering up the half-starved and poorly clothed soldiers who were on guard duty. Because of bad management food and clothing were not delivered.

an American victory at Germantown. Soon it was too late for Howe to aid Burgoyne. Though unsuccessful in two battles and though Philadelphia had been taken by Howe, Washington had gained more than he had lost, for he had enabled the northern army to capture Burgoyne.

UNNECESSARY SUFFERING AT VALLEY FORGE

During the winter of 1777-78 the British enjoyed themselves in Philadelphia, but for Washington's army in the little village of Valley Forge it was a time of horror. There was not enough food, and clothing was scarce. Sometimes the men left bloody tracks upon the snow and it was difficult to keep them from going home. And the worst thing about this suffering was that it was unnecessary, if the American Congress had known how to manage better. There was food enough and clothing enough in the country if it had only been sent to the right places at the right times. During this dreadful winter some members of Congress and some army officers tried to put Gates in Washington's place but failed as they deserved.

FRANCE AGREES TO HELP THE AMERICANS IN THE WAR

But in all this discouraging time, one bright thing happened. France had been loaning money to help carry on the war. Now she recognized the independence of the colonies, made a treaty with them, and agreed to send a fleet to help. The surrender of Burgoyne had been so discouraging to England that in February, 1778, the British government gave up every single point in the dispute and agreed not to try to levy any taxes on the colonies if they would disband their armies. If this had been done three years before there would have been no war, but it was now too late. The people would be satisfied with nothing less than complete independence.

During all this time the colonies had had no regular navy, but had sent out privateers to attack the British merchant ships and had captured many of them. A privateer was a ship owned by a citizen which was given permission to attack and capture ships belonging to the enemy. These privateers were so successful that the British had begun to send a war-ship with every merchant

fleet to protect it. Later, by the help of France, a few war vessels were gotten together and under John Paul Jones did considerable damage to the British, who called him a pirate. They even demanded that other nations should give him up if he sailed into any of their harbors, and the fact that Holland would not, had much to do with bringing about a war with that country.

WAR NOW IS CARRIED ON IN THE SOUTH

England was soon at war with France, Spain and Holland and so could not send over enough troops to crush the Americans. In 1778-79 no very important battles were fought but the British tried harder to persuade Tories to enlist in the army. The plan of the war was also changed. Instead of trying to cut the colonies in two, troops were sent to the South to conquer those colonies one at a time, but the Tories and Indians were stirred up in all the colonies. Georgia was soon taken, as the colony was very weak, and soon South Carolina was also under British authority.

For a time there was no army in the state but not all were willing to give up. Small bands of patriots, under Francis Marion, Thomas Sumter, Andrew Pickens, and others, hid in the swamps, from which they dashed out to attack the Tories or even small bands of British troops, and would retreat to their hiding-places before they could be captured. They could not do much but they kept the British uneasy. Marion was often called the "Swamp Fox" and Sumter the "Game Cock," one because he was so silent and so swift in his movements, and the other because in battle he fought to the death.

THE STORY OF MARION AND THE BRITISH OFFICER

Perhaps you have heard the story of the British officer who visited Marion under a flag of truce. A flag of truce is an arrangement by which one is given permission to approach an enemy on business without being fired upon, or being taken prisoner. The officer was met at a certain place by some of Marion's men, who blindfolded him and led him through the swamps. Finally the bandage was removed from his eyes, and he found himself in a little open space in the forest. His business was

HARD FIGHTING IN THE SOUTH



Major Patrick Ferguson was one of Cornwallis' best cavalry officers, and was sent to enlist the Tories in the British army, and to subdue the western part of North and South Carolina. At King's Mountain, near the line between the two states, he was surrounded, October 3, 1780, by the backwoodsmen from Virginia and the Carolinas. Some came over the mountains from what is now Tennessee. Ferguson and 400 of his men were killed and the remainder were taken prisoners. This blow forced Cornwallis to retreat.



The next year Colonel Banastre Tarleton, the chief British cavalry officer, attacked General Morgan at the Cowpens and was badly defeated. During the battle, Colonel William Washington, who was not a relative of General Washington, met Tarleton in personal combat and wounded him in the hand. This was one of the most brilliant victories of the war and did much to cheer the drooping American spirits.

soon finished and Marion asked him to remain to dinner. The officer saw no cook and no evidence of cooking though a fire was burning on the ground, but accepted. Then Marion told his servant to serve dinner. The servant raked aside the ashes of the fire and drew forth some sweet potatoes which had been roasting there. These he served on pieces of bark. There was no other food. Whether this particular story is true or not, the American soldiers often had little more to eat than this.

GATES IS DEFEATED AND FLIES FROM THE FIELD

When an army was raised to try to recapture South Carolina and Georgia, it was put under the command of Gates whom many still thought to be a great general, because the troops under his command had captured Burgoyne. While marching to make a night attack on Cornwallis in August, 1780, he was met at Camden by that officer, who was also marching to surprise him. The American army was cut to pieces and it is said that Gates rode his horse seventy-five miles without stopping in his wild flight. Many people grew discouraged and the British felt that the whole South would soon be in their power.

ARNOLD'S TREASON SHOCKS THE COUNTRY

Just about this time the treason of Benedict Arnold, about which you may read on another page, shocked the country, but a victory occurred soon after and aroused more hope. Colonel Patrick Ferguson, one of Cornwallis's officers, with about 1,100 British and Tories was defeated and killed at King's Mountain by a band of backwoodsmen from Virginia and the Carolinas, who fought without a leader, and killed or captured all of the British force. A new army was raised and put under Nathanael Greene. Meanwhile Morgan defeated Tarleton, the British cavalry leader, at the Cowpens, in South Carolina, and then retreated into North Carolina to escape Cornwallis. Morgan was joined by Greene, and Cornwallis followed but could not overtake them. Finally Greene turned and a battle was fought at Guilford Court House, near the present city of Greensboro, North Carolina. Though the Americans were

defeated, Cornwallis lost many men and decided to march to the seacoast. After reaching Wilmington, he then determined to go to Virginia to join other British commanders there. Greene marched back to South Carolina and soon drove the British into Charleston.

In Virginia Cornwallis tried to capture Lafayette who had a small force, saying, "The boy cannot escape me," but the boy did, and his force grew larger, as the Virginians joined him. At one time Cornwallis almost captured Thomas Jefferson, then the governor of the state. Cornwallis determined to retreat toward the sea, and sent to Sir Henry Clinton in New York asking reinforcements. Early in August he reached Yorktown, on the York River, and waited for an answer. Clinton, however, believed that New York was much more important than Virginia and would not send any more men.

WASHINGTON TRANSFERS HIS ARMY TO THE SOUTH

Washington was then on the Hudson River near West Point. The year before, 6,000 French troops under Count Rochambeau had been sent over, and just now Washington learned that a strong French fleet under Count de Grasse was on the way. He determined upon the bold idea of leaving New York and marching to Yorktown. On August 19, 1781, the march was begun, and Philadelphia was reached before Sir Henry Clinton knew what he was doing. The French fleet prevented General Clinton from sending any aid by water, and soon the American and the French armies, about 16,000 in all, were at Yorktown. The siege was begun, no help came to the British general, and on October 19, 1781, Cornwallis surrendered 7,247 men and 840 sailors, more than 8,000 men in all.

The American army was drawn up in one line, the French in another. Between them marched the captured army with bands playing a tune called "The World Turned Upside Down." How proud Washington must have felt as he looked over his veterans and remembered the dangers, hardships and discouragements through which he had passed. Cornwallis, sick with mortified pride and bitter regret, remained in his tent, and sent his sword by another.

THE NEXT STORY OF THE UNITED STATES IS ON PAGE 1305.

THE MAN WHO LOST & THE MAN WHO WON

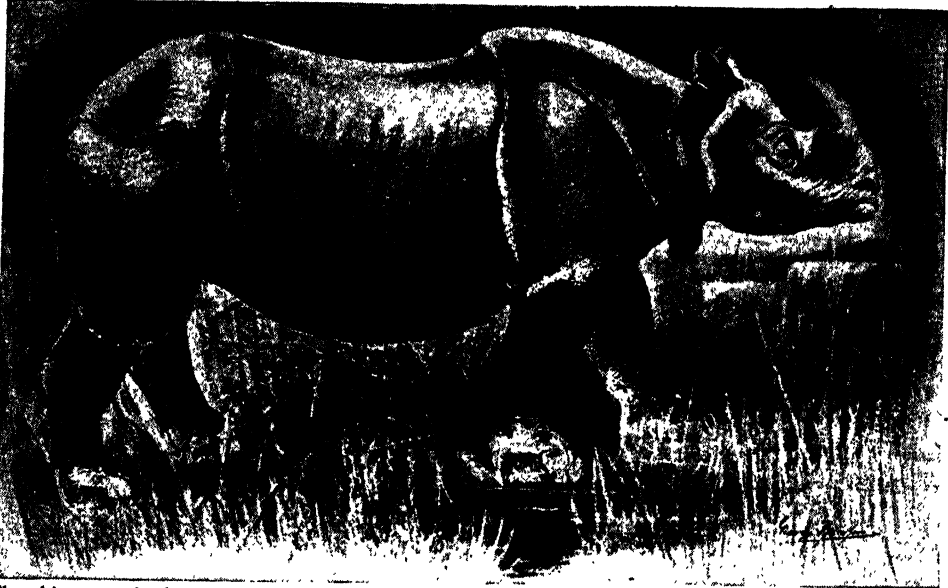


This is a picture of one of the closing scenes in the War of Independence, which, after lasting over six years, was ended by the fall of Yorktown, where General Cornwallis and a British army were besieged. This picture shows Cornwallis with his generals during the siege, shortly before he surrendered, in October 1781, to General Washington and the French General Rochambeau. The surrender of Yorktown ended the war.



George Washington had no easy task in commanding the American army. The British army was made up of trained soldiers; but the American troops were farmers, or huntsmen, or townsmen, who left their business to fight, freemen whom it was difficult to force into discipline, because each man thought himself as good as an officer. Also, it was a difficult thing to provide these men with arms and equipments and pay, and often many of them wanted to go and take care of their business. Still, Washington managed to keep them together, and he led them to victory. This picture shows his farewell to his generals at the close of the war.

THE GIANT ANIMALS OF TO-DAY



The rhinoceros is the ugliest of all our big animals, and can always be recognized by the curious horn on its nose. Some rhinoceroses have two horns and some only one. These animals live wild in Africa and Asia, and they are extremely savage and bad-tempered. The rhinoceros does not wait to be attacked, but will rush on a man as soon as it sees him. The horn is not bone, but hair grown solidly together.



The hippopotamus is one of the largest land animals, often as large as an elephant, with much shorter legs. It lives in Africa, and spends most of its time in the water. It is able to remain below the surface for as much as ten minutes at a time. It has the power of closing its nostrils so that it can keep in its breath and also prevent the water from entering. Its great mouth opens like a cavern and it has enormous teeth of hard ivory. It has very short legs in proportion to the rest of its body.

The Book of NATURE

WHAT THIS STORY TELLS US

WITH a generous hand Nature strews the whole earth with food. That which is useless to one creature may be the one thing needed by another. But to gain its food an animal must perform useful service. The fierce rhinoceros, tearing through the undergrowth, lets light and air into the forest. The hippopotamus, browsing on the vegetation that grows in the water-courses, keeps the channels open so that rivers may flow freely and not flood and ruin the land about them. The tall acacia tree is no good as food to the short-necked animals, but it is life to the giraffe. Ants perform good service in the world, but they become so numerous that they are a plague to mankind; and therefore we have strange animals that live by eating ants. In this story we see how curious monsters have their service to perform. They are Nature's outposts, placed, as it were, to keep open the way for man.

SOME VERY STRANGE BEASTS

THIS is our last story about the animals that live on the land. Afterwards we go to the animals that live in the sea, to the reptiles and birds and insects. For this story we have some of the strangest animals in the world. Later we shall have to go over some of our old ground and grow to understand how science has been able to trace the plan of Nature with regard to her family. That will interest the boys and girls who write asking how the animals that we know to-day came to be so very different from what they once were.

Naturally they are puzzled by the disappearance of the terrible giants which formerly lived, and by the growing up of types utterly different from those which in the long ago had the globe to themselves. We shall see in time. We shall try to understand how it was that while in America we had rhinoceroses bigger than those now living, others in different parts of Europe grew so small as to be no bigger than a sheep or pig. We shall see, too, that the elephant, which was once the towering giant of the north, wasted away in Europe to the size of a Shetland pony.

Even here we must have a glimpse of family relations in the animal world to realize how the creatures of the earth came to be what they

CONTINUED FROM 878



were. The hippopotamus and the rhinoceros are the biggest animals in the world, except the elephant. Their bodies are nearly as large as that of the elephant, but their legs are shorter. Remember their great size, then you will see how wonderful it is that their distant cousin is the hyrax.

The hyrax is a little animal about the size of a rabbit, which lives in Syria and parts of Africa. It is the animal which is spoken of in the Bible as the coney. David sang: "The high hills are a refuge for the wild goats, and so are the stony rocks for the coney." That is a little animal living among rocks and mountains, yet it is related both to the hippopotamus and the rhinoceros. Though its teeth are small, some of them are shaped like those of the rhinoceros, and it is the link between this great animal and the hippopotamus, the elephant, the tapir, the horse, and the rodent family.

Fancy a horse or an elephant or a rhinoceros living in a rocky hole in the ground as the hyrax does! Of course, that is impossible. But all these animals came from the same stock originally, and the little hyrax has teeth and skull and feet like tiny copies of the rhinoceros, while in some ways its teeth are like the rodent family, which we know

includes the rat and the squirrel. The hyrax has always lived in Africa and in Asia, but in prehistoric times it also lived in Europe, where its remains are found in the rocks.

TIGERS IN THE ENGLISH JUNGLE AND HIPPOPOTAMUSES IN THE THAMES

Its bigger relations all had their home in Europe, where our forefathers lived. There were tigers in the jungles of England, there were rhinoceroses in the swamps and tangled weeds, and great herds of hippopotamuses sported in the Thames. And man, a poor, puny savage, was there, living in caves, with only the skins of animals to cover himself. We cannot say how long ago this was, but it was many thousands of years. The rhinoceros that the very ancient Britons used once to see was larger than any now living. There were two or three sorts. One of them had two horns, the other had none.

There is a two-horned rhinoceros living to-day in Africa very similar to the two-horned one which lived in Europe. Both these varieties lived in England before ever man appeared there. The sort which kept man company in the land was the huge woolly rhinoceros. It had a great horn upon its nose five feet long, and was much bigger than any living rhinoceros. Nowadays the rhinoceros lives, when wild, only in Africa and Asia. The Indian rhinoceros has only one horn. The African rhinoceros has two horns; and there is a smaller type called the hairy-eared rhinoceros, which lives in Burmah. The two sorts in Africa are called white and black, yet both are greyish-black in color. There is no such thing as a white rhinoceros, any more than there is a white elephant. But the African rhinoceros is said to look almost white when the sun shines on it.

If you look at page 61 you will see some old French drawings of what are supposed to be elephants. You will see at once that they are only the size of tapirs, and that the legs are wrongly drawn. The hind legs, for instance, are

drawn turning outward like a dog's instead of forward like a man's. There is just as strange a drawing of a hippopotamus, which is shown eating a crocodile, although the rhinoceros and the hippopotamus are both vegetable feeders.

But vegetable feeders can be fierce as well as the meat-eaters. There is nothing in the world more savage than a bad-tempered rhinoceros. Every now and again it seems to go mad. The sight of a man will nearly always make it angry; and if he wounds it, then the great beast will rush at him with such speed that even a fast horse is hard pressed to carry the hunter out of danger. If it catches him, the monster will toss and gore a man to death and trample his body to pieces. Even when not provoked in this way the rhinoceros has fits of passion. Suddenly it will cease feeding and rush at a tree or a bush, and rage until it has torn the bush to pieces or gashed the trunk of the tree through and through. If there should be a man sheltering in the tree, the rhinoceros will try to tear it to pieces so as to get at him.



Though the hyrax is only a little animal, it is a first cousin to the rhinoceros, and has hoofs instead of claws on its toes.

Its power for mischief lies in its horn, or horns. These grow up from its enormous snout. The horn is not solid bone like the horn of other animals, but a mass of densely pressed hair or fibre, grown solidly together. It answers the same purpose as horn, but it is even stronger. It is wonderfully supported. It does not grow out of the bone of the animal's head, as other creatures' horns grow, but grows up from the skin itself, and a gash from a sharp knife will remove it from the skin.

HOW THE RHINOCEROS IS ARMORED AGAINST ITS ENEMIES

Under the base of the horn the bone of the rhinoceros's head is enormously thick and arched, so that it may resist the heavy pressure which is brought to bear when the animal gives way to one of its fits of rage, and charges at some great tree. If it were not arranged like this, the beast, when thus charging,

would stun himself or smash his skull. It can stand any amount of pressure in a charge; but once, when a rifle bullet struck a rhinoceros on the tip of its horn, the animal dropped so suddenly and lay so still that men rushed up to cut it in pieces, believing that it was dead. But it was not dead. It had fainted, if you can say such a thing of so big a beast. It had been stunned by the sharp shock, so different from that to which it was accustomed. With this horn the rhinoceros can fight its enemies, and it can also obtain food in the jungle and swamp.

But its great strength does not rest all in its horn. It has a power of resisting wounds such as few creatures possess. Its skin is enormously thick—two inches along the back and sides. The hide

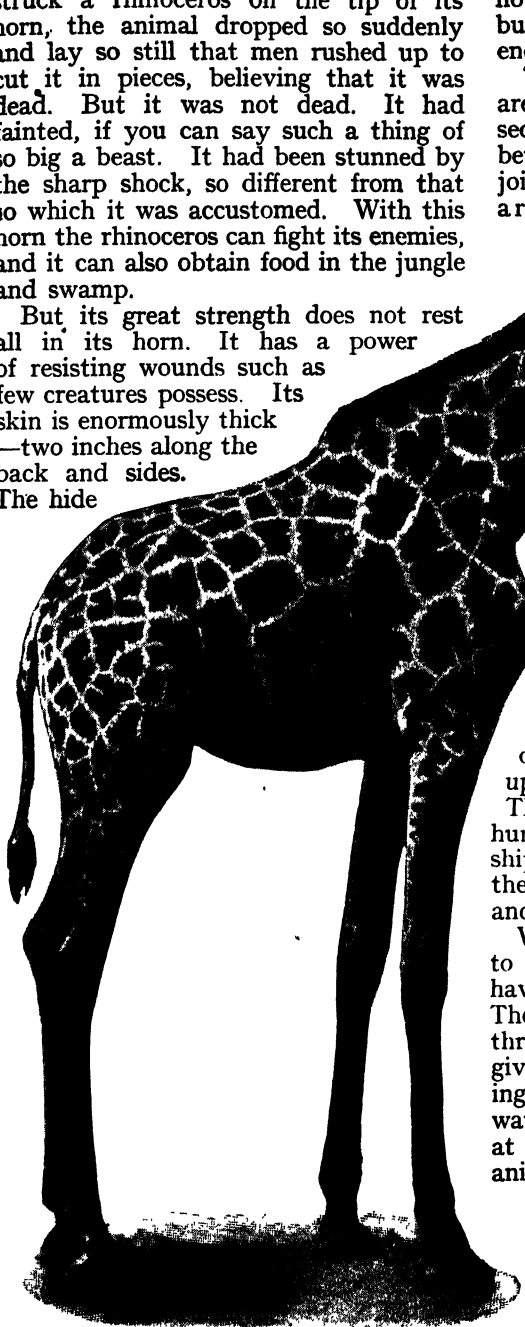
lies in great folds, and looks very like armor. And it really is armor, which Nature has given it. Therefore it need not fear any creature but man and very tiny enemies.

The tiny enemies are flies and insects, which get between the joints of the armor.

Where the great hide folds, the little flies swarm. They find the skin not so tough in there, and bore their way into the giant's flesh. To prevent this, the rhinoceros, which likes to lie in the shade during the day, is driven to the water, where it lies down and wallows, like a pig. It deliberately covers itself with mud, so that those flies which remain upon it are either drowned or suffocated.

There is one other way in which the rhinoceros can obtain relief. He makes friends with a bird, called the rhinoceros bird. This little creature is allowed to walk about the body of the great animal, because it feeds upon the insects which worry the giant. The rhinoceros has sense enough not to hurt the bird, so they have a partnership. The rhinoceros carries upon his body the flies which make a meal for the birds, and the bird comes and pecks them off.

We must remember this when we come to the alligators and crocodiles, which have birds to act for them as toothpicks. The rhinoceros bird is about the size of a thrush, and with its shrill note is said to give the rhinoceros warning of approaching danger. It is always fascinating to watch the rhinoceros and hippopotamus at the Zoo on a quiet day. These two animals, with the elephant, seem to help us to picture the animals of the Old World better than others. The rhinoceros, when it lies or stands still, seems as if it might be some strange carving of rock. The hippopotamus, with its little eyes and ears, and its enormous body, helps the mind to picture the monsters of the dim old days when human life among such



The beautiful giraffe is by far the tallest of all our land animals. Some specimens measure 18 feet from the top of the head to the ground. The color of the giraffe, which lives in Africa, is a reddish white with dusky spots of large size. Its favorite food consists of the leaves and young twigs of trees.

frightful monsters as then possessed the earth would have been almost impossible.

If we think of the reindeer and other Arctic animals which lived here, then look at the hippopotamus, which has its home only in blazing hot Africa now, we can understand what changes of climate this land of ours has seen. If the hippopotamus were set up on legs as big as those of a horse, what a terrific beast it would be! Its legs are so short that you can hardly believe that the height of the animal is a little over five feet. It has an enormously thick, oily skin, and beneath the skin is a great layer of fat, which keeps the animal warm in the water.

We do not wonder that such an animal can walk under water, though we feel surprized, perhaps, that it can hold its breath when down below for more than ten minutes at a time. It seems natural that such a monster should sink when it goes into the water, but so marvelously is it adapted to its life that it can swim and dive like a fish.

WHY THE HIPPOPOTAMUS CAN STAY SO LONG UNDER THE WATER

The reason that it can remain so long under water is that it has the power to close its nostrils so that it can retain its breath, and at the same time prevent the water from entering its nostrils. When it comes up to breathe it seems to delight to blow the air just below the surface of the water, with a noise like a fog-horn. In its natural state the hippopotamus loves the company of its fellows, and twenty or more are to be seen together sporting in the rivers. Woe to the boat which ventures in their way. Upon the least provocation, or even without provocation, they will upset the boat and kill the men in it. Their great mouths open like caverns, and they have enormous teeth of such hard, unbreakable ivory that scarcely anything can withstand them.

A baby hippopotamus was captured in the Nile some years ago to be brought to London. While this was going on a big hippopotamus dashed at a man who was sitting at the end of the boat, and with one snap of its terrible mouth bit him right in two at the waist. The young hippo mentioned here was not the first to go to England. The first was a young one caught in Egypt, in

the Nile, and seen for the first time in London in 1849. It was the first time that a hippopotamus had set foot in Europe since the days of the Roman Empire, when great conquerors used to exhibit them after some big victory. The first one that went to England was called Obaysch, after the island in the Nile where it was caught. It lived at the Zoo for thirty years, and then died of old age.

HOW THE HIPPOPOTAMUS SAVES THE RIVERS FROM BEING CHOKED UP

You will want to know what purpose such a creature as the hippopotamus serves. It has done important work for geography. With its vast teeth it tears up and eats the great plants and weeds which grow in the rivers. It goes up and down a watercourse in search of food, and acts the part of one of Nature's dredges. If it had not been for the hippopotamus the rivers of Africa would have been choked with vegetation, they would have overflowed their banks and flooded the country round about. Therefore, instead of swift rivers, flowing in proper channels, the water would have run far and wide, making the country round about one vast swamp.

But the hippopotamus is not always man's friend. Where men cultivate the land near the haunts of the hippopotamus the animals go forth sometimes at night, and eat the crops. With their great mouths they mow down the crops as if scythes had been at work. It is another case where animals have been doing man's work until man himself appeared to do it, to cultivate the land in his own way, and to reap the reward which the fruitful earth gives to him that toils. But though the hippopotamus which raids men's fields must be killed, that is no excuse for cruel men who, for the love of slaughter, track the hippopotamus into the wilds and there slay it.

THE GIRAFFE, THREE TIMES AS HIGH AS A TALL MAN

One of the houses at a Zoo which we are always anxious to visit is that in which the giraffes live. No matter how carefully the giraffe may be described, and no matter how good the photographs, its extraordinary appearance cannot be realized unless the animal itself be seen. It is like nothing else in the world. Though the elephant is a great

SOME VERY STRANGE BEASTS

deal heavier, the giraffe is so tall that the biggest elephant is only half as high as the tallest giraffe. The tallest measure 18 feet from the top of the head to the ground—three times as high as a tall man. The neck, though possessing only seven bones, is extraordinarily long, and set up on high front legs. The back slopes down from the root of the neck to the tail.

The color of the giraffe is a reddish-white, with dusky spots of large size. Once upon a time the giraffe perhaps belonged to the same family with the sheep, oxen, deer and antelopes. But, instead of feeding upon grass and low shrubs as these feed, it found its food in trees, which grow higher. It ceased to feed upon the ground, and in the

course of ages its neck became longer and longer, so that it might reach the food which it likes. Its favorite food is the acacia and thorny plants. To reach the acacia it must have a long neck, for this tree has no low branches. But the acacia grows thorns, and so do the other trees upon which the giraffe feeds. These thorns, if taken into the mouth or nose, would injure the animal. The giraffe has a special muscle which enables it to close its nostrils. This keeps

out the thorns, and also keeps out the sand, which blows in the desert, where it often wanders in its home in Africa. Moreover, the giraffe has a very long upper lip, which is sensitive, like the elephant's trunk, and yet tough. Thorns cannot pierce it. With this long lip the giraffe can pull towards it the thorny boughs; then it shoots out its long tongue, and neatly picks off the leaves and buds which it likes. This tongue is another wonderful instrument. Though long and tough it can be made very pointed at the end.

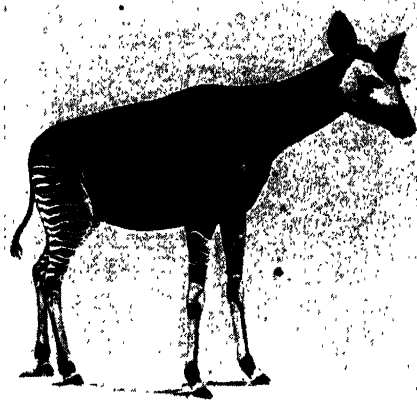
When an animal becomes specialized in this way it is in danger of sacrificing other qualities. If it feeds high, it cannot easily feed low. So that its food

supply shall not fail where trees are scarce the giraffe is able to straddle its front legs wide and bring its head to the ground. The skin upon its chest is loose, to enable the necessary stretch to be made. But the giraffe never feeds in this way if he can help it. He must lower his head, however, to drink.

In a fair fight the giraffe does bravely against a mighty lion. With its hind legs it kicks with enormous force, and so quickly that the eye cannot follow the movements of the legs. The nature of the giraffe is usually gentle, like that of a deer, and the animal will run away rather than fight, except when it is attacked by its own species. It is graceful and beautiful to watch when walking, its long neck swaying like the mast of

a gliding yacht. When it runs, however, it is ungainly. Sometimes those at the Zoo indulge in a frolic, and it always makes those who are watching laugh to see their strange antics.

Still, when at liberty, the giraffe's gallop serves its purpose. It races along faster than a horse, and the lion cannot catch it on the run. It was long supposed that the giraffe



The okapi is one of the latest animals that we have learnt about. It was discovered in Africa by Sir Harry Johnston. No living okapi has yet been brought to America, and it will not live in captivity. The okapi in the picture is stuffed.

was one of the few living creatures which has no voice. But we know now that the baby giraffe makes a noise resembling the bleating of a lamb and the cry of a young calf. When the old ones are angry and fight, they make a great bellowing. The battles take place when some old king of a herd is challenged by a young giraffe which wants to be king. They dance and caper round each other, rearing and kicking until the young one's strength wears the old one down.

As the giraffe is so different from other animals, it was thought until a few years ago that it belonged to a family quite by itself; that the forms from which it had descended had died out. Only its teeth and one or two other features served to guide us to the story of the way in which it had developed. But

then another of the fairy stories of science came true.

THE SEARCH FOR THE OKAPI

The Congo natives told of an animal which was like a deer and a zebra, and at the same time like a small giraffe. No white man had seen one, nor could they find it, and so they thought at first that the natives were telling one of their stories of animals which do not exist. But the natives insisted that they knew the animal, and that its name was "okapi."

To prove the truth of their statement they brought skins of some of these animals which they had killed for food. These skins were seen to be different from that of any known animal, so a great traveler, Sir Harry Johnston, who knew all about wild animals in Africa, set out to find one for himself. He knew where to look, for he knew where to find the only food the okapi eats, but he did not succeed in seeing one, though he got a skin.

Major Powell-Cotton, another traveler, spent nine months trying to find an okapi; but he only got the body of a dead one, which a pigmy hunter, a tiny savage man, had killed with his spear.

At length, the Museum of Natural History in New York sent Mr. Herbert Lang and Mr. James P. Chapin to Africa in search of rare animals, and particularly an okapi, for the Museum. They left New York in 1906, and returned in November 1915, laden with photographs and specimens. They had made their way on foot through dense tropical forests of the Belgian Congo, up the sluggish rivers, and through the great swamps of that unhealthy region, in search of the okapi. They found that it did not live in the swamp as was supposed, but on the higher dry ground in the forest. It comes down each morning to drink in the swamps, and the natives set traps for it and sometimes catch it. Once Mr. Lang reached the spot where a large one had been trapped while it was still alive, but the poor animal, exhausted by its struggles for freedom, soon died. Another

time a native, who was a very skilful hunter, brought him a little baby okapi. Mr. Lang tried to keep it alive, but it only lived a week.

The okapi is very shy, and the moment it hears or smells a man in the distance, it rushes off into the deep forest. It is a solitary animal. Two okapis are seldom found together, and the mother okapi hides her little one, and usually leaves it alone. Perhaps it is because of this shyness that this singular species has lasted so long. It really belongs to the same period of the world's history as the sabre-toothed tiger and the giant mastodon, and perhaps there were okapis before ever man appeared on the earth.

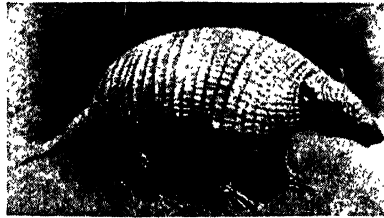
THE GREAT FAMILY OF ANT-EATERS, AND THE ECHIDNA

The okapi has legs and hoofs and a body like a deer, but its legs are striped like those of a zebra. Its head is like that of a giraffe, and it has teeth which had previously been supposed to be peculiar to giraffes. Moreover, it has a bony growth upon its head like the horn of the giraffe.

We read all about the echidna in our last story, so now we may follow that up with the family of the ant-eaters, as

strange animals as ever lived in the world. The echidna is a much older form of animal than the common ant-eater. Indeed, it is said that the echidna must have been the prophecy of the true ant-eater, which means that from an echidna-animal the ant-eaters are descended. They are South American, and are of three kinds—the great ant-eater, the lesser (about half as big), and a third, a yellow silky toy one of Panama, no bigger than a rat.

The great ant-eater is a big animal, four feet long, with an extraordinary tail, which is another four feet in length. The body is covered with long, brown, coarse hair, while the tail itself has hair so long and thick that when it is put up over the animal's back it serves for an umbrella to keep off the rain and the sun. It has claws which remind you of the claws of a sloth, but the ant-eater has four claws on each front foot, and five claws on each hind foot. The claws



The armadillo is a funny little animal found in America. It has scaly armor almost like a tortoise, but it can run swiftly. It burrows in the ground and lives mainly on refuse.

ANIMALS THAT LIVE ON ANTS



The ant-eater is a big animal, four feet long, with an extraordinary tail about the same length. The body is covered with long, coarse hair, and the claws on its fore-feet are so long and sharp that the foot cannot be put flat to the ground, but has to be turned over on its side in walking. It has no teeth, and picks up the ants on which it feeds by means of a long, sticky tongue, and sweeps them into its mouth.



The aardvark is an African animal, and its curious name, given by the Dutch, means "earth-hog." It is a big animal, measuring about five feet in length, and sleeps by day in a burrow, coming out at night to feast among the ant-hills. Its pig-like head and long ears help to give it a very strange appearance.



The pangolin, which is found in Africa and Asia, is covered from head to tail with hard, tough scales, each scale being made up of tightly-woven hairs, all joined fast together as in the horn of the rhinoceros. The pangolin lives in a burrow, where it stays all day. It has a long, sticky tongue, and feeds entirely on ants.

The photographs in these pages are by Charles Reid, Lewis Medland, W. P. Dando, and A. S. Rudland

in front are so long and sharp that the foot cannot be put flat upon the ground. The foot is turned over on its side in walking, and the claws curl up, shielded by hair and a pad of flesh.

THE ANT-EATER GOES OUT AT NIGHT AND TEARS UP THE WHITE ANT'S HOME

This big animal has no teeth. None of the ant-eaters has teeth except the aardvark and the armadillo. The ant-eater's mouth is a long, thin snout. From this it shoots out a long, thin tongue, which is covered with a sticky substance. At night the ant-eater rouses itself from its nap and walks off to where the terrible white ants, called termites, have built their great mounds. With its powerful claws the ant-eater rips open the sides of the mound. The ants, frightened at this, pour out, but the ant-eater shoots forth its long sticky tongue, sweeps them into its mouth, and swallows them.

The ant-eater busies itself in this way until the dawn is at hand. Then it scurries off into the bushes and lies down. It has no settled home. It simply lies where it thinks fit. It curls itself up, the head tucked down to the breast, the feet locked together, and the wonderful tail spread all over the body. There it lies in safety, for it looks just like a mass of old hay or dried grass. But should an enemy attack it, the ant-eater will fight. Its front paws are very strong, and with these it gives a terrible blow.

THE ARMADILLO, WHICH DIGS MORE QUICKLY THAN A MAN CAN

The armadillo is not a true ant-eater. Insects form only a small part of its diet. It will eat almost anything—vegetables, grain, insects, and flesh, good and bad. The armadillo is really one of the useful scavengers of South and Central America. It helps to eat dead bodies of animals, or parts of animals, which men throw away, which, if left, might cause fever near human dwellings. It is a singular beast. It has scaly armor almost like that of a tortoise, but its head does not need to be drawn into the shell; the armor covers it right down to the nose. Its legs are free, and it can run with great swiftness. Upon its feet are powerful claws, with which it can burrow faster than a man can dig. If you try to dig one out of the burrow in which it hides by day it

burrows deeper and deeper while you are digging.

A man made up his mind one day that he would have an armadillo, no matter what happened. He got it in the end, but he had to dig for eight hours, and in that time had to sink six deep pits, one after another. There used to be giant armadillos, but it is the smaller ones with larger brains which have lasted down to our own day.

The aardvark, as we have seen, is a true ant-eater. It is an African animal, and its name, given by the Dutch settlers, means "earth-hog." It is a big, heavy animal, five feet in length, including the tail, which may measure eighteen or more inches. It sleeps by day in a burrow, and comes out at night to feast among the ant-hills. It has legs better adapted for running than the ant-eater has, and its claws are so big and powerful as to be like hoofs. Its pig-like head and long ears give it a very strange appearance.

THE PANGOLIN, WHICH HIDES BY DAY AND HUNTS BY NIGHT

But there are more ant-eating animals than these. There is a small one which lives in the trees and has only two toes, like one of the sloths; there is a scaly ant-eater which carries its little ones in a pouch, and lives in Australia. Then there is the pangolin, which is a near relation of the aardvark. It is covered from head to tail with hard scales, each made up of tightly-woven hairs, all fast joined together.

There are several forms of pangolin, and they are to be found in Africa and Asia, but not in America. They all have the sharp claws and long, sticky tongues of the ant-eater. Their claws are splendid for their proper work, but they are not of much service for running, so the pangolins keep to their burrows by day and hunt by night.

We should not know what to do with pangolins in America but in the parts where they live they are a blessing to men. The ants are one of the greatest nuisances of hot countries. They eat men's food and clothes, their books and furniture, and they bite men, too. The ant-eaters are good friends in ridding men of these little enemies, and should not be killed.

THE NEXT STORIES OF ANIMALS BEGIN ON PAGE 1067.

The Book of OUR OWN LIFE

WHAT THIS STORY TELLS US

WE have read of the tiniest living things, and we know how wonderful and important in the world are the microbes the eye cannot see. We learn here something more about the microbe, something that helps us to understand the oneness of all life. The microbe is the simplest thing that is alive, and it is made up of a single cell. Everything alive is made up of cells; just as a house is made up of rooms, just as a family is made up of people, just as the whole of anything is made up of parts, so every living thing is made up of parts, and these parts we call cells. These cells are the very beginning of life; we cannot trace life farther back than the cell. A boy, or a girl, or an oak-tree, or a spider, is made up of millions of cells, but a microbe is nothing more in itself than just one cell. We learn this here, and we learn, too, that the life in this single cell seems very like the life in you or the life in anything we know.

THE SIMPLEST KIND OF LIFE

WE have been talking lately about the tiniest living things. These are very different indeed from our own bodies, and some of them are the greatest enemies of our bodies; but we had to talk about them early in our study, because without their life no higher life would be possible. Another important reason for doing so is that life in all respects apparently seems one and the same, and that, if we are to study life properly, we should begin with it in its simplest forms.

Now, each microbe is a single living cell, and the microbe is therefore interesting not only on its own account, but also because all living creatures are made of living cells, and so, if we study the life of the microbe, we are preparing ourselves for the study of higher forms of life.

Every creature that exists, a moss, or a man, or a microbe, or a monkey, or a fish, is made of living cells, but if we survey the whole world of life in this fashion we find that a very great division can be made. In the one division are creatures that are made simply of one cell, and in the other are those made of more than one cell. The one-celled creatures were certainly the first to appear on the earth, and we have already learnt a good deal about them. We need the microscope to see them with.

The many-celled creatures are all

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the visible world of life, animal and vegetable; but though there is such a vast difference between, shall we say, an oak-tree and a microbe—the first made of countless billions of cells, and the other made of only one—and though the difference is a thousand times vaster than any question of numbers of cells, yet we find that the living cell in each is astonishingly similar, whether it is the single cell of a microbe, or a cell in the leaf of an oak-tree or in the skin of your hand, or anywhere. If we could learn the secret of the cell, we should have the secret of life, and the first great lesson we have to learn is the great lesson of oneness in different things.

It is true to say that all wisdom, in every branch of knowledge, is more truly wisdom the more truly it sees the one in the many; and there is no more striking case of this than the world of life with its infinite variety—they say there are 80,000 different kinds of beetles alone. Yet the more carefully we examine this measureless variety, the more clearly do we see that it can all be reduced to the wonderful powers of one unit, and that unit is the living cell.

In everything we study, we desire to find the simple things that make up what we are looking at. Let us take one or two instances. When we

study nations and peoples, we try to find out what it is that they are made of. We learn that they begin in the family—father and mother and children living together, and so we cannot know too much about family life. Or, when we are studying matter, we must find out its elements, if possible, and we know that matter is made up of atoms.

THE LIFE OF THE AMŒBA, THE HUMBLEST ANIMAL ON THE EARTH

When we study atoms, as we do in another part of this book, we find that they, too, are made up of still smaller things, which have something to do with electricity, and are called electrons. So we say that the unit of a nation is the family, that the unit of matter is the atom, and that the unit of the atom is the electron.

In the same way, then, we find that all living matter is made of cells, and so we say that the cell is the unit of life. We cannot know too much about it. Already we have studied a number of cells closely resembling one another, which we call microbes. Wherever we turn in the world of life, we find cells and yet more cells. Having looked at the cells which form the bodies of the simplest plants, we may now look at the simplest kind of animal, especially because the cell which makes it is what we call a typical cell—that is to say, it has all the characters of cells in general.

This humblest of animals is called the amœba, and is readily found in ponds; it simply consists of a single cell, which we will read about now. Remember, meanwhile, that we are really describing a kind of thing which not only makes the amœba, but is found in the bodies of many other creatures. For instance, our own blood contains countless millions of cells, which are very like the amœba in almost every way. Instead, then, of mentioning the amœba again, we will simply speak of it as the living cell, and understand that what is said is true of ordinary cells in general.

THE LITTLE BALL IN WHICH LIFE MAKES ITS HOME

Microbes are not quite typical cells, for the typical cell is more or less round, like a little ball. Many cells are bounded by something which we call the cell-wall. The cells of animal bodies are very often without this cell-wall; most of the cells of our own bodies, for instance,

have no wall. But when cells were first discovered by the microscope, it was in plants that they were seen; and most plants do have a cell-wall, which is rather tough and hard, and is not itself alive any more than the shell of a snail is itself alive, but it has, of course, been made by the living cell. There is a particular kind of stuff out of which the plant makes its cell-wall, and the name cellulose has been given to it.

When cells were first seen in plants, the cell-wall was so conspicuous that men thought it was the important thing, and they thought that what was inside of it was mere food material or fluid. But now we know that many cells have no cell-wall, and that the wall is merely what the name suggests—a means of protection for the living matter inside. Cellulose is a tough substance, which our stomachs cannot digest; and now we can understand why we cannot digest a raw potato. The potato consists mainly of starch, made and stored up by the living cells of the potato; it is stored up by them inside their cell-wall.

A ROUND SPECK OF MATTER THAT MOVES BY ITSELF AND IS ALIVE

If, then, you eat a raw potato, the starch is shut up inside walls of cellulose, which the juices of your stomach cannot break down; but when the potato is cooked the cellulose walls are burst, and then our digestive juices are able to get at the starch and turn it into sugar, which passes into our blood and gives us strength. That is all we need say about the cell-wall, and now we must turn to the really living part of the cell.

Let us go back to the amœba. This has no cell-wall. If we watch it under the microscope, which is not a difficult thing to do, we shall see a very good reason why it should not have a cell-wall. The amœba is just a round speck of living matter, but it can move "of itself," as we say. You know already that movement is usually a mark of living things, and this amœba, like most cells, can move itself bodily about. It does this by crawling. It swells out one side of its body, and then pulls the rest of its body after it. It cannot crawl as quickly as a worm, but it can crawl.

Of course, if the amœba had a stiff wall round it, it could not crawl; and as it crawls it is bound to change its shape,

THE SIMPLEST KIND OF LIFE

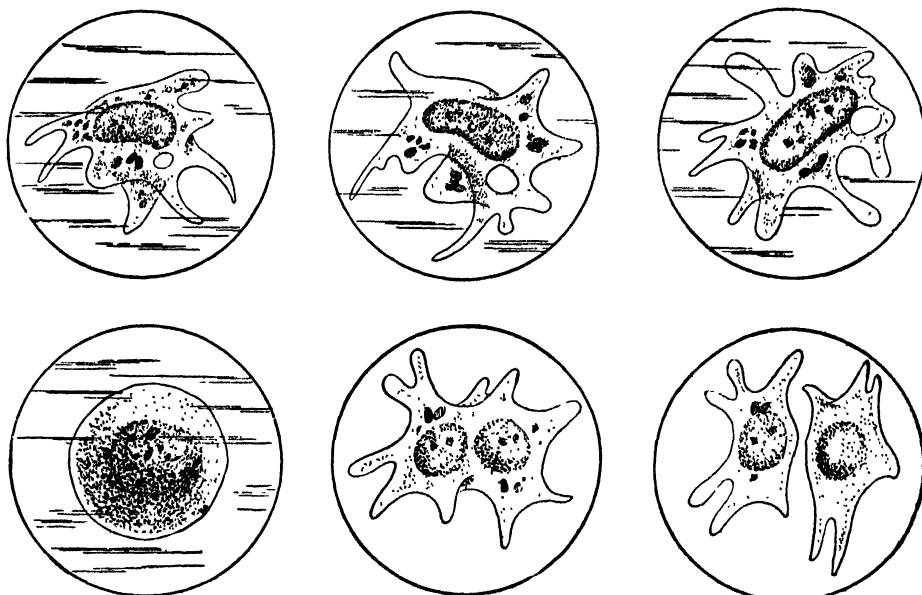
and so, though we call it round, when the amoeba is active and looking for something to eat, it is not round, but has an irregular shape which changes from moment to moment. It is only round when it is starved, and almost dead, or perhaps when it has had plenty of food and is resting after a meal.

But we now know that there is a very simple way of making an amoeba stop moving and become quite round, and this way is very interesting because it teaches us that all life is the same everywhere. You have no doubt heard of chloroform. This is a liquid, looking

crawling under the microscope, and you add the very tiniest amount of chloroform to the water in which it is moving, it is poisoned; it stops moving, and, so to speak, curls itself up into a round ball.

Of course, if you give too much chloroform, the amoeba will be killed, just as a man would be killed if you gave him too much chloroform. But do you not think it is very interesting that the same stuff should act in the same way upon every kind of living cell? I do not want you to imagine that the cells in our brain look like the amoeba, or

THE SIMPLEST THING ALIVE ON THE FACE OF THE EARTH AND HOW IT CHANGES SHAPE



The amoeba is the humblest animal alive, the simplest thing on earth that moves of itself and has life like ours. These pictures show what an amoeba is like. The three pictures at the top show an amoeba floating in a drop of water, much smaller than a pin's head, and show how it changes shape in a minute or two. The first picture in the bottom row shows how the amoeba changes into a solid mass if touched, and the last two pictures show the amoeba dividing so as to make two, both alive and in every way the same as the one.

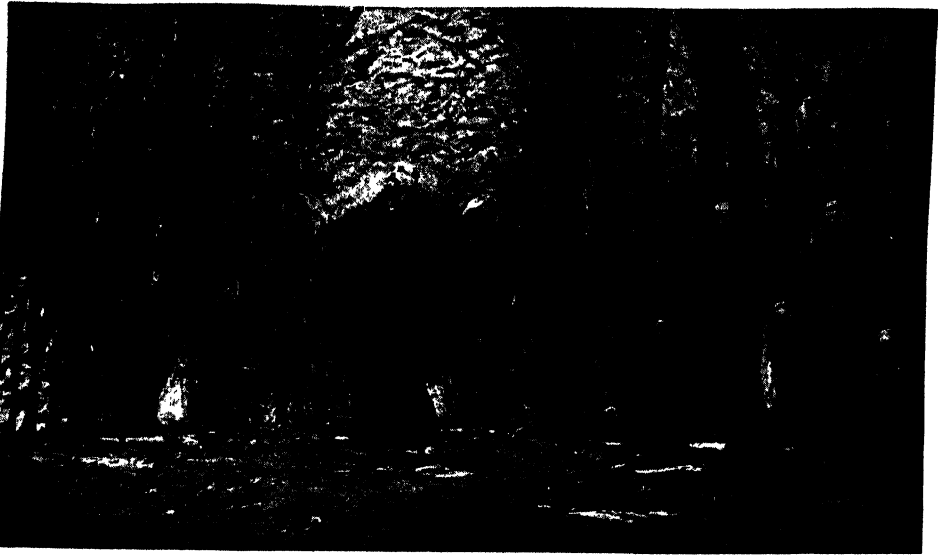
rather like water, but with a curious odor, which is given to people to inhale when perhaps they have had a finger crushed, and the tip of it has to be taken off. It sends them to sleep in a peculiar way, so that they feel no pain. This is because the chloroform acts on the cells of their brain and makes them stop working; but in the chief matters all cells are really the same, and all true poisons, like alcohol, chloroform, prussic acid, and so on, act on all cells alike.

So, if you are watching an amoeba

that they crawl about; they have a very different business. Nevertheless, they are alive, and the point is that all living cells everywhere, whatever their business is, have their life arrested if they are chloroformed, because in reality all life is one and the same. If this teaches us nothing else, it should teach us to respect all living things, and to remember that, though they may be very poor and humble relations, yet they are truly relations of ours.

THE NEXT PART OF THIS IS ON PAGE 1121.

ST. FRANCIS AND ST. NICHOLAS



In Assisi, in Italy, in the thirteenth century, lived the son of a wealthy merchant, who is remembered to-day as St. Francis. He spent his youth in vanity and foolishness, until there came to him a vision which brought his folly to an end; and Francis cast aside his wealth and lived a life of sacrifice. This picture shows St. Francis among the birds, because he loved to be among them, speaking of them as his friends.



A rich young man named Nicholas, walking through the streets of his native town, heard a sad tale of the distress of a starving father and his daughters. Nicholas hurried home, and at night took a bar of gold to the poor man's house, thrusting it through the window. So many other gifts of love did Nicholas, that he has been named St. Nicholas, whom we call Santa Claus. This picture shows St. Nicholas with the children.

MIL
TAN

His love for God included love of the beautiful earth which God has made. He hated cruelty. He told people to love "our sisters the birds," and even spoke of the wind as "our brother," and the rain as "our sister." He felt that all things are brothers and sisters, and that God is the Father of all.

St. Francis is dear to us for many reasons; but perhaps we are grateful to him, more than for any other of his virtues, for just this simple teaching—that we should never be unkind to bird or beast, but should treat them all as brothers and sisters, and spread the love of God among all living things.

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THE GIANT WHO CARRIED THE POOR

HOW OFFERO BECAME ST. CHRISTOPHER

AN old hermit was sitting in his cell one day, when there appeared before him a mighty and huge man, who said his name was Offero, and told him the strangest of stories.

"I was strong from my youth up," he said, "and beat every comer at games and sports. But I wearied of these idle things. A voice within me drove me forth, and would not let me be satisfied.

"So I put on my armor and took my sword, and journeyed till I came to the palace of the greatest king on earth. Him I served, until one day I saw him make a sign on his forehead whenever the minstrel who sang before him made mention of the Evil One. I would not serve him longer, because he feared the Evil One, and was not a brave man. So I journeyed on, till in the centre of a deep, dark forest I found Satan keeping his court.

"'Art thou the bravest king on earth?' I asked. And when he said that he feared nothing, I took service with him.

"But one day I saw him cower from a little wooden cross set up on the highway, and I challenged him, saying:

"'What! are you the bravest man on earth, and fear a piece of wood?'

"'It is not the cross I fear,' said he, 'but Him who once hung there.'

"So I left him, and have ever since striven to discover who is this Christ who hung upon the cross. And now the voice within me has brought me to you. Tell me, I pray you, the story of Christ."

The hermit told him, and the giant

lifted his great sword to the sky, and swore that he would henceforth serve only Christ. The hermit said that Christ did not wish men to fight for Him, but to fight against evil by gentle living and prayer.

Offero said that might well be true; but it was evident that God had not given him great muscular strength for nothing, and that strength he would devote to Christ. So the hermit took him to the banks of a wide and angry river, and bade him dwell there and help poor people to go across. This pleased Offero well, and he built a hut, and tore up a pine-tree for a staff, and when poor people wanted to cross the angry flood he carried them over, and said he did it for the love of God.

One wild night a little child came to him to be carried across, and Offero set him on his shoulder and waded into the foaming stream. But as he went the child grew heavier and heavier, so that Offero's knees bent under him. Yet he got across, and when he set the child down he said:

"How is it that you are the heaviest burden I have ever carried?"

Then the child became glorious with a wondrous light, and said to Offero:

"Heavy did I seem to thee because I bear the sins and sorrows of the whole world. I am Christ. And because thou hast been kind to the weak, and hast borne Christ upon thy shoulders, I will call thee henceforth Christopher."

Then the Child vanished, and Christopher kneeled in the darkness.

ST. URSULA & THE TEN THOUSAND MAIDENS OF BRITAIN

AMOST wonderful sight was seen one day in Brittany. In a great meadow were gathered together more than ten thousand of the loveliest maidens from Britain, and on a throne was seated the Princess Ursula of Brittany, telling these British maidens the story of Jesus Christ.

Princess Ursula was the only daughter of the King of Brittany, and so lovely that the story of her beauty had passed into all lands. Prince Conon of Britain desired her for his wife, and she told him to send her ten of his greatest ladies, each escorted by a thousand maidens,

and to wait for her three years. Then she taught these ladies to be Christians, and set out with them to visit foreign lands, while Prince Conon at home gave himself up to a study of Christ.

Princess Ursula and her great company of ladies made a wonderful impression wherever they went, and many people became Christians because of them. And Prince Conon's love waxed so strong that he came and followed her, with many great bishops and clergy, including even the Pope of Rome. And Conon longed for the time when Ursula would be his bride; yet was he very

ST. CHRISTOPHER AND ST. URSULA



Offero the giant once stood at the edge of an angry flood, when a child came to him to be carried across ; he set him on his shoulder and waded through, but the child grew heavier, and became glorious with a wondrous light, and said, " Heavy did I seem because I bear the sins and sorrows of the world. I am Christ; and as thou hast been kind to the weak, and borne Christ upon thy shoulders, I will call thee Christopher."



The beauty of Princess Ursula, the only daughter of the King of Brittany, was known in all lands, and the princes and her ladies went everywhere to tell men of Jesus. One day they came to the court of a king whose wickedness Ursula denounced so bravely that the king seized an arrow and shot it into her heart.

happy to go across the world with her, spreading knowledge of the blessed Savior. And Ursula loved him, but she knew that God had a great work for her to do. So they all went together, telling people of the love of Christ.

But in this pilgrimage Ursula came to a place where the heathens of the land rose against her, and they slew the bishops and clergy, and Prince Conon and his knights, and all the women except Ursula, whose lovely face dashed

the courage of the most brutal men, and stayed the hands of the most savage.

So Ursula was brought before the king, and he said he would marry her; but she spoke to him so truly of the wicked murders he had done that he himself seized an arrow and shot it into the heart of Ursula. And thus it was that Ursula came into heaven last of all that shining host who had gone across the world at her bidding with the message of Christ's love.

ST. CATHERINE, THE GIRL WHO DEFIED AN EMPEROR

A COMMON sight at a celebration such as Independence Day is the Catherine-wheel. It is a wheel made up of a wooden hoop with sticks for spokes, and little rockets all round the rim, so that when fixed to a wall and lit the gunpowder inside the rockets lights and hisses and spouts sparks, and causes the wheel to revolve, so that it looks like a ring of brightly-colored fire.

The Catherine-wheel gets its name from a saint who was bound to a wheel. It was Saint Catherine of Alexandria. She was a Christian, and the cleverest girl in Egypt of her day. She lived in the fourth century, when most of the people about her were heathen. One day she heard that the Emperor Maximinus had ordered that many poor people should be slain as a sacrifice to the idols the emperor worshipped, and Catherine went to his palace and condemned his cruelty and stupidity.

It was in vain that he tried to argue with her. She was too clever for him, and what she said was too just and right to be affected by anything that he could urge. So the emperor sent for all his wise men to argue with her. They were as helpless as he had been. She defeated them all in a great debate, and many people became Christians on hearing her wonderful words. This made the emperor angry, and he ordered that she should be put to death—tortured to death on a wheel.

What this wheel was like we do not now exactly know. One account says that it was shaped like an ordinary wheel, but armed with spikes, which hurt her at every movement. Another account says that it was not one wheel, but four wheels joined, armed with teeth. Whatever the nature of the wheel,

poor Catherine was bound to it. But a wonderful thing happened. No sooner had she been tied to the wheel than an angel appeared—so the story in the old books runs. The angel loosed her bonds and set her free. He broke the wheel in pieces; he killed the man who had invented it, and destroyed also several of the cruel people who had gone to see the brave girl tortured. Those who escaped ran away, crying, "Great is the God of the Christians! He doeth wondrously both in the heavens above and in the earth beneath."

But the wicked emperor was not content. He had Catherine beaten with scourges, and caused her to be cast into a dark dungeon and kept without food for twelve days. But in her sorrow there came to her comforting visions and healing for her wounds, and the stories say that a dove brought her food.

At the end of the twelve days the emperor had Catherine led forth, and ordered his executioner to strike off her head with a sword, and so at last she died.

That is the story which the old books tell. We need not believe it all as having happened exactly like this. People did not then write history at the time that events happened. For years and years a story would be told by word of mouth, and by the time that it first came to be written exaggerations and mistakes would creep in.

But it is certain that St. Catherine was tortured on a cruel wheel, and that she escaped from it with her life. The old pictures of her show the wheel as her symbol, and to this day we get the name of the Catherine-wheel, which all boys know, though perhaps neither they nor the firework-makers know how the name came about.

ST. CATHERINE BOUND TO A WHEEL



Long ago in Egypt, Catherine of Alexandria went to the emperor and rebuked him for his cruelty to Christians. The emperor ordered that Catherine should be put to death, and she was bound to a wheel armed with spikes, and cruelly tortured. Catherine escaped from the wheel, as told on opposite page, but was beaten and thrown into a dungeon, and at the end of twelve days the emperor ordered her to be beheaded with a sword. The firework known as the Catherine-wheel gets its name from the wheel to which she was bound.

ST. BENEDICT, THE BOY WHO FLED FROM ROME

MANY years ago there was a wealthy family in Italy, and the only son was the pet of the house, on account of his pleasant, cheerful manners and the brightness of his understanding. His parents wished him to become a judge, and while he was yet a youth they sent him into the great and mighty city of Rome to study law. But the boy,

whose name was Benedict, found Rome a dreadful and a wicked place; he was shocked by the luxury that met his eyes, and by the light, flippant, and very often evil conversation which reached his ears. Instead of thinking about the law, he thought about this wickedness, and wondered what God must think of the city of Rome.

So greatly was he shocked by the wickedness of the city that he ran away from it, and hid himself in the hills, determined to serve God in silent loneliness. But his old nurse, who loved him dearly, followed Benedict, and waited upon him with tender care. For a long time he lived in this manner, until it seemed to him wrong that he should let this old woman fetch him food, and once more he ran away. This time he traveled far into the mountains, and lived in a wild and savage cave. He did not escape temptations in this lonely life, and once he was so frightfully tempted to return to

Rome that he flung himself naked into a thorn-bush and rolled in it till the pain had driven all evil thoughts out of his mind.

Many years passed, and people heard of the holy man living alone in a cave and thinking only of God. They came and visited him. A company of monks were so impressed by his preaching that

they asked him to come and rule over them, and this he consented to do. But Benedict found that the monks lived too easily, and he introduced a greater sternness into their lives. Then the monks repented that they had ever asked him to be their superior, and, we are told, poisoned some wine and presented it to Benedict. But Benedict was warned, and he made the sign of the Cross over the wine, and the cup fell to the ground and was shattered into fragments. Then Benedict returned to his cave, and many holy men came to live near him; and he



Many years ago the son of a wealthy family in Italy ran away from Rome, frightened by its terrible wickedness, and became a hermit. A small company of men followed him to the mountains, where they lived together pure lives, seeking only the glory of God. And in many parts of the world to-day men still live as followers of Saint Benedict, whose portrait this is.

built houses for them to live in. These monks had to desire three things—poverty, purity, and obedience—and they had to agree to work several hours every day with their hands. St. Benedict caught a fatal fever in nursing the poor, and while he was dying he bade his followers bear him into the chapel, where he died before the altar.

ST. NICHOLAS, THE REAL SANTA CLAUS

A YOUNG and rich man was walking one day through the streets of his native town, when he heard sounds of lamentation from the house of a nobly born man whose money was all lost and who was now living on the verge of starvation with his three daughters. The young man listened, and he heard a girl's voice say :

• "Father, let us go into the streets and beg, for it is hard to starve."

Then he heard the proud father make answer :

"Not yet. Not to-night. Let us wait one more night. I will again pray God to save my children from such disgrace."

Nicholas hurried home. Among the treasures he had inherited from his father were three bars of solid gold. He took one of these bars at night to

ST. AGATHA, THE BRAVE MARTYR-GIRL OF SICILY

QUINTIANUS, the Governor of Sicily, was in love with a very beautiful Catanian girl named Agatha.

She was proudly bred, and of rich parentage ; so that when she avoided him, and even ran away to a distant city, he thought it was her pride that governed her. But presently he discovered the truth. Agatha was a Christian.

The governor sent soldiers, and had her brought before him. For a long time he pleaded with her earnestly to give up her religion ; but she remained faithful.

Then the love of Quintianus turned to a most hideous hatred. He had the beautiful girl, whose faith he could not shake, cast into a dungeon. Then she was stretched upon the rack, and the cords were tightened, till her bones

the house of the poor man, and finding an open window, which he could just reach by standing on tiptoe, he thrust in the bar of gold and departed. Then he came a second night, and left the second bar ; and the third night, and left the third bar. But the third night he was discovered, and the poor father, who believed that the gold had come from Heaven, knelt at his feet. Nicholas lifted him up, and said :

"Give thanks to God, for it was He who sent me to you."

This and many another splendid gift of love did Nicholas in the name of God and always in secret, so that he is called St. Nicholas, and we say that he comes to children on Christmas Eve and fills their stockings with gifts for the sake of his Master the Lover of all children and the Savior of mankind.

started. But she clung to Christ, and would not be persuaded to deny her faith.

Then the inhuman monster who had been her lover used the sword upon her, and she was thrown back into her prison terribly wounded. No doctor was allowed to see her, no nurse to tend her. But as she lay on the ground of her cell no cry or moan escaped her lips. Instead, a lovely smile of happiness overspread her face, and in a great peace she sighed out her soul to the Lord Jesus Christ.

Such was the faith of this girl. Like all the company of saints, she was so sure of Christ, so certain of Eternity, that no agony could affright her, no death could appal her.

ST. CRISPIN, THE PATRON SAINT OF SHOEMAKERS

THE patron saint of shoemakers is St. Crispin, and the reason is this.

In the third century there lived at Soissons, a small town of Italy, two natives of Rome, two brothers, Crispin and Crispinian.

They were teachers of Christianity ; but they thought it right to earn their own living, and this they did by the making of shoes. They charged money to the well-to-do, but for the very poor they made these shoes without charge of any kind.

Their fame spread, and many of the people in Gaul visited them, and learned from them the story of Christ's love. At last there came to Soissons the heathen emperor, and he commanded that these shoemakers should be arrested, and they were tried, tortured dreadfully, and afterwards beheaded.

Whenever you see the picture of a saint with the palm of victory in one hand, and in the other an awl, you may know it is either Crispin or Crispinian, the patron saints of shoemakers.

ST. CECILIA, THE SWEET SINGER OF ROME

THERE was a strange scene one day in the city of Rome when it was a crime punishable by death to be a Christian. A handsome young Roman soldier, by name Valerian, had just brought home

his bride, a very beautiful and proudly bred Roman girl, named Cecilia. The festivities were over. The guests had all gone. Valerian was alone with his bride. Then Cecilia said to him: "I am your wife, but I do not belong to you. I belong to Christ. All my life up I have given myself to Christ, and I have a guardian angel who will guard me from evil."

Valerian was much surprized, for he had no idea that the noble parents of Cecilia were among the despised Christians.

"Show me this angel," he said to his wife; "then I shall know if what you say is true."

She told him that he could not see the angel until he had learned to love Christ, and bade him go along the Appian Way, outside the city walls of Rome, and ask the poor people who lived there to direct him to Urban the Good. This Valerian did, and he found Urban living underground in the Catacombs. Urban told him the story of the Fatherhood of God and the Sonship of Jesus Christ,

and Valerian believed and was baptized. So happy was he in his new faith that he persuaded his brother also, and these two, with the beautiful Cecilia, spent their lives in doing good to the

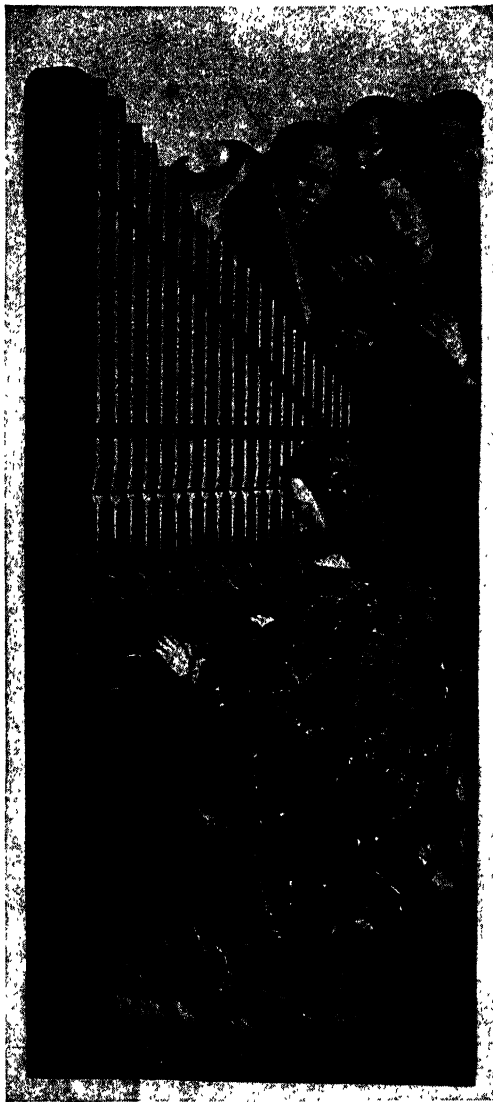
poor. The home was very happy, for Cecilia had a lovely voice, and she sang songs to God which thrilled the hearts of the two brothers, and they knew that after death they would all meet in a happier world.

Soon it became known that Valerian and his brother were Christians, and they were put to death. But Cecilia became bolder in preaching, and was brought before the governor.

"What sort of a woman are you?" he asked roughly. "And what is your name?"

"I am a Roman lady," she replied proudly. "Among men I am known as Cecilia, but my name is Christian."

Then she was condemned, and they carried her away to her own house, and placed her in a bath of boiling water. She was then bound, and a sword descended upon her neck, but did not sever it. For three days she lived, giving all her money to the poor, and singing praises to God; then she died, and was called ever after St. Cecilia.



St. Cecilia, whom this picture shows playing on the organ, became a Christian in the great days of Rome, when Christianity was despised, and she and her husband, a handsome young Roman soldier, spent their lives in doing good. Then she was condemned, and died a terrible death, singing.

THE NEXT STORIES OF MEN AND WOMEN ARE ON PAGE 1167.

The Story of THE EARTH.

WHAT THIS STORY TELLS US

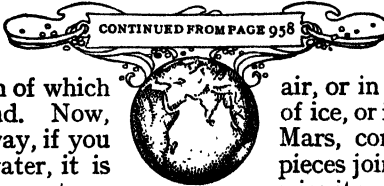
JUST as a heap of sand is made up of grains of sand, so a glass of water is made up of drops of water. In these pages we learn what a drop of water is. The tiniest drop of water that it is possible to have, so small that we cannot see it with our eyes, is called a molecule, which means a *little mass*, and is the word used for the smallest part we know of any compound. A molecule of water, everywhere and always, whether in your body, or in the air, or in the sea, or in the form of ice, or in the air of the planet Mars, is made up of three pieces joined together, and no drop of water can exist without these three parts, which join together to make a molecule of water. Here we learn what a molecule of water is made of. It is made up of two kinds of gas—two parts of hydrogen and one of oxygen.

WHAT WATER IS MADE OF

IF you take a heap of sand, you know that it is made up of tiny grains, each of which is itself a grain of sand. Now, in exactly the same way, if you take a tumbler of water, it is made up of tiny little parts or particles, each of which is a particle of water; and the whole bulk of the water is just made up of a number of these as the heap of sand is made up of grains of sand. These particles of water are so small that, if you could imagine a row of them, it would certainly need many millions of millions of them to stretch out as far as an inch.

Now, there is a special name for these tiny parts or particles of anything, and as this name is used all over the world in describing them, we must learn it. The word is *molecule*—pronounced molly-cule—and it is the Latin name for a *little mass*. Now, I am sure you will understand that if we want to find out what water really is, the best way for us would be to take one of these molecules—in imagination, for, of course, they are far too small for us to do it in reality—and find out what it is made of. This is, of course, really impossible so far as one molecule is concerned. Nevertheless, we are absolutely sure of what we should find if we were able to take one molecule of water and pull it to pieces.

Now, let us imagine that we have this molecule before us. The first thing we find is that it consists of three pieces. Every molecule of



water, everywhere and always, whether in your body, or in the air, or in the sea, or in the form of ice, or in the air of the planet Mars, consists of these three pieces joined together. Otherwise it would not be water, and nothing else is water, however much it may look like water. That is one of the things we are absolutely certain of.

Further, because water is always made of molecules consisting of these three parts, all water everywhere, on the earth, or on Mars, or on a planet belonging to some other sun than ours a million million miles away, always behaves in exactly the same way as all other samples of water. It has its laws, which depend upon its nature; and as its nature is the same everywhere, so its laws are the same everywhere. We can watch the snow-caps of Mars melting under the influence of the sun's heat, just as snow melts on the earth.

Everywhere in the universe, water under the same conditions will boil in the same way, will melt in the same way, will freeze in the same way, will dissolve the same amounts of the same things, will form drops in the same way, will have exactly the same properties of every kind; simply because whenever and wherever you find water it is one and the same thing.

Now, what are the three parts of which the molecule of water is always made? This is, on the whole, the most important molecule of any kind

that we know in the universe, and as it is also one of the simplest, it is a good one to begin with; and, even supposing all the three parts had different names, it would not be too much to expect you to learn them, considering what an important thing water is. But, as a matter of fact, two of these parts are the same as each other, and so our lesson will not be a difficult one. The picture on the next page is an imaginary picture of the way in which a molecule of water is made.

WHAT A MOLECULE OF WATER WOULD LOOK LIKE IF YOU COULD SEE IT

I say an imaginary picture because, though we have drawn the three parts as if they were round, we really know nothing about that, since we have never seen them. We do know that they exist, and that by some power or other they are held together. We also know, by the way, that this power is extremely strong, because it takes great trouble and effort to break up a molecule of water; that being the reason why for so many ages men thought that water was an element.

Now, you must understand what this diagram is. It is a single part, or molecule, or unit of water. A lot of water—like a tumbler of water or the Atlantic Ocean—is made up of a number of these molecules taken together. But a single molecule is the smallest possible portion of water that can exist. If you break it up so that its three parts do not hang together, then it is no longer water at all, but is simply a mixture of the two kinds of stuff which make up water. This we must be quite clear about, for it is the difference between a *compound* and a *mixture*, and that is one of the most important differences in the world.

HOW TO MAKE ONE O CATCH HOLD OF TWO H's

If you had in a jar—and this is quite easy—a number of the kind of things marked H in the picture, and also a number of the kind of things marked O, and even supposing that you had twice as many of the H as of the O, so that the proportion between the two was the same as it is in water, yet that jar would not contain water, but only a mixture of the stuff called H and the stuff called O. That mixture would not be water, and would not look like water; and the astonishing thing is that, even at the

ordinary temperature of the room, this mixture would not be liquid at all, but just a mixture of gases, and by looking at it you could not possibly tell it from that other mixture of gases which we call air. In a little while we shall see how it would be possible to do something with this mixture of H and O so as to make every O catch hold of two H's and form a molecule of water; and then, instead of the mixture of gases that we had before, we should have a tiny drop of water, and this water would actually be made out of that mixture of gases.

Now, that is what water is—a compound made out of the two gases which up to now we have called by the first letters of their names, H and O.

Now, what do H and O stand for? First of all, let us take O, because we have heard more about it already. O stands simply for the gaseous element *oxygen*, which we talked about in connection with the air; oxygen is the most important thing in the *mixture* of gases called the air, and it is the most important thing in that *compound* of two gases which we call water. In the drawing the artist has made the O very big indeed, and the H's quite tiny, for each O really weighs as heavy as sixteen H's. Therefore, though there are two H's to one O in every molecule of water, O, or oxygen, forms eight-ninths of all water, which is made up of one part of H and eight parts of oxygen.

EACH MOLECULE OF WATER HAS TWO ATOMS OF HYDROGEN & ONE OF OXYGEN

I hope this is quite clear. If each H weighs one-sixteenth part of one O, then in anything made up of two H's and one O you will have sixteen parts of O and two of H; which equals eight parts of O and one of H. This is the same as saying that eight-ninths of water is made of O, or oxygen, and one-ninth of H.

Now, what is H? H stands for another gas, called *hydrogen*, and hydrogen is really a very good name for it, and tells us what it is, for the word simply means the thing that *produces water*, and H, or hydrogen, is simply the gas with which oxygen produces water. Only it will not do for them to be merely mixed, but they must be *combined*, and they must be combined in the special way shown in the picture—two H's for one O. There is another

WHAT WATER IS MADE OF

way in which hydrogen and oxygen can combine in which there are two H's for two O's, so that each molecule of this other substance consists of four parts instead of three. But this other substance is not water; it is not even a special kind of water, but is something quite different.

Now, there is another word which we must learn here. What is the name of the tiny specks of H or of O which go together, two of the first to one of the second, in order to form a molecule of water? These tiny specks are called atoms, and so we can say now that *water is made of molecules, and each molecule contains two atoms of hydrogen and one of oxygen.*

So when we speak of an element like oxygen or gold, we simply mean something consisting of a number of atoms all of the same kind. When we speak of a compound, such as water, we mean something made of molecules which themselves are made up of atoms of at least two kinds; and when we speak of a mixture, we simply mean that two or more kinds of atoms, such as oxygen and nitrogen, have got mixed up together.

Now, atoms are most important things, for it is their properties that give the elements their properties. Gold is gold because it is made of atoms of gold; and oxygen is oxygen because it is made of atoms of oxygen. And, just as we saw that all the molecules of water are the same everywhere, and that all water

everywhere are all the same, and we can know them because they are the same.

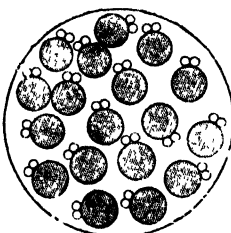
Finally, let us remember the way in which water can be made. If we take the right proportions of oxygen and hydrogen—that is, eight times as much oxygen as hydrogen, so as to give us two hydrogen atoms for every one of oxygen—and if we let them mix in a jar, and if then we pass a spark of electricity through them, the atoms of the two gases will rush towards each other, each atom of oxygen taking two of hydrogen; and the two gases will totally disappear, leaving in place of them a tiny drop of water.

If we want to express very shortly the nature of water—that is to say, the make-up of a molecule of water—we can simply write down a big H for hydrogen and put a little 2 beside it to show that we want two hydrogen atoms; and then we can take a big O to stand for oxygen, and put a little 1 beside it to mean that we want one oxygen atom; and then we can write them together like this, H_2O_1 . In order to save trouble we usually drop out the 1, and so, when we want to write water

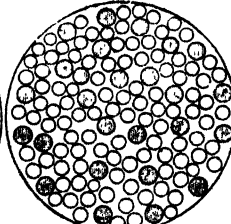
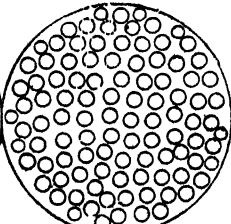
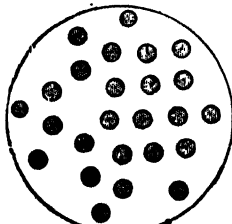
in this special way, we simply say H_2O , and that represents the molecule of water, made up of two H, or hydrogen, atoms, and one O, or oxygen, atom.

About half of all the matter of the earth, so far as we can examine it—that is to say, including the crust of the earth, the sea, and the air—is made up

of oxygen, and all the other elements put together make up the other half. I hope we are quite clear now about the difference



The tiniest part of water is made up of three parts like the top picture, called a molecule; the large picture shows how these together form a drop of water.



The pictures show how atoms mix. The dark balls are like atoms of an element, such as oxygen. The light balls are like atoms of another element, such as hydrogen. When the two mix, we get a mixture of elements, as in the third picture. The air is such a mixture. Oxygen and hydrogen make such a mixture, but that is not water, for water is a compound, not a mixture.

element are the same. There are atoms of oxygen in this page before you, and in your eye, and in the sun, and in water, though in water they are com-

between an atom and a molecule. The two words used often to be confused, but we must use them rightly.

THE NEXT STORY OF THE EARTH BEGINS ON PAGE 1189.

THE KING WHO DEFIED THE NATION



Charles Stuart believed that kings could do no wrong, and when King of England he trampled down the rights of the nation and cared nothing for the freedom of the people. The people rose in anger against the tyranny of the king, and armed men to fight—the Parliament and the nation against the king and the nobles. This picture shows Charles raising his standard at Nottingham, where the great Civil War began.



King Charles, who had set his people at defiance, was hunted up and down the land. Oliver Cromwell, a plain country gentleman farming in Huntingdon, raised a wonderful army, which fought the king from battlefield to battlefield and beat him everywhere. At last Charles was captured and tried as a traitor in Westminster Hall, where he was condemned to death. This picture shows the king departing from his trial.

The Book of ALL COUNTRIES

WHAT THIS STORY TELLS US

WE have come to the most stirring time in the history of England, the time of the Stuart kings. The idea that kings could do no wrong filled the minds of the Stuarts, until they ruled so harshly that it seemed as if they had forgotten Magna Charta. The old tyranny came back, and the king trampled on the rights the people had won. But the people would not let their freedom go. There came a farmer from Huntingdon who left his farm, who led the people against the king, who raised the finest army of men that has ever been known, who defeated Charles Stuart, imprisoned him, had him tried and led out to die for his sins against the people. For eleven years there was no king in England, and Oliver Cromwell ruled the Commonwealth. We read his wonderful story, and the full story of Charles I. and the men of the Civil War, in the BOOK OF MEN AND WOMEN; but here we run quickly over these eventful times in this history, until the reign of the Stuarts came to an end.

THE TIMES OF THE STUARTS

THE messenger who rode north at such breakneck speed to tell James Stuart that his cousin Elizabeth was dead did the journey in a few days, much to everyone's surprise. Now news is flashed between Edinburgh and London in a few seconds, and we travel the distance by rail in about eight hours!

So secure did James feel about the succession to the English crown that his journey south was a sort of pleasure excursion, taking three or four weeks. A few of his lords attended him, and they ambled along day after day, through the heart of the quiet country, in the pleasant spring weather, being entertained at fine houses on the way.

Three centuries had passed since the old Hammer of the Scots, Edward I., had so ardently desired that the north and south kingdoms should be united under one ruler—three centuries of constant war; now on one side, now on the other, of the Border. Yet the desired union of the crowns did not come about on the battlefield, but peacefully by inheritance, and by request of Parliament, when James VI. of Scotland was crowned James I. of England in the old coronation chair, over the old block of stone that the Scots had so hated to lose, within a few feet of Edward's resting-place in the Abbey.

CONTINUED FROM P. 862



For another hundred years the two countries had their own Parliaments and governments; but under the last of the Stuarts the union became complete.

Let Sir Walter Raleigh lead us into the Stuart times, the times when England began to spread beyond her old sea boundary, for he was one of the first to understand the real use of the discoveries of Columbus and Elizabeth's sea captains. James set his heart on finding gold and treasures that could be brought over in ships. What really was needed was for English people to go over the ocean and make new homes in the New World, and found states to be governed by the same laws as at home. Then the settlers, or colonists, must cultivate their new estates and grow food, not only for themselves, but for other parts of the world. It took many years for the nations on the east of the Atlantic to realize the wonderful extent and use of the lands on the west, and nearly all the sixteenth century passed away before they seriously put in claims to share in them.

The first settlers from every country had hard times to bear, and much failure. It was Sir Walter Raleigh who named England's first colony after Queen Elizabeth, Virginia, and James gave it a charter.

By this time Spain, Portugal, Holland, France, all had dominions on each side of the Atlantic, and very soon struggles and fights about the new lands arose, which led to nearly two centuries of war amongst the five greater nations of Europe.

This spreading out of empire across the ocean led to another cause of war. When the ocean became a pathway to the New World, instead of a boundary to the old, each nation wished to be mistress of the seas, and to have the greatest number of ships upon them, manned by the most daring sailors. They wanted to protect their countrymen as they passed to and fro, whether they were bringing home rich treasures or "carrying" goods for other countries.

To-day the English have more shipping at sea than any other nation in the world; and they have spread out over the world, as colonists, more than any other people. We find the first steps towards this greatness in the days of the Stuarts.

THE BEGINNING OF THE GREAT WAR BETWEEN THE KING AND THE PEOPLE

James I. had even stronger ideas about the rights of kings than the Tudors; he believed not only that as a king he could rule and do as he liked; but that, because he was a king, he could do no wrong. This belief, which he passed on to his sons, caused great trouble in England; and freedom had once more to be fought for.

An echo from the early days of James's reign is heard every year in London streets, which is a reminder of how real and bitter was the struggle three hundred years ago. We all know the words:

"Please to remember the fifth of November, gunpowder, treason, and plot."

Year by year poor Guy Fawkes is carried round the town to be burnt in a bonfire at night. This old custom has been kept up in memory of the horror felt when he and his friends tried to blow up the king and Parliament by hidden barrels of gunpowder in the cellars under the House of Lords.

Soon after this a new plan was tried in Ireland to bring it into line with the rest of the kingdom. The owners of the land in Ulster were declared to

have lost their rights to it by rebelling against England, and were driven out. English and Scotch settlers obtained these lands, and, being thrifty and industrious, they and their descendants have made the north-east corner of Ireland the most prosperous part of the country.

THE LITTLE BOAT THAT CARRIED THE PILGRIMS TO AMERICA

The settlers who landed at Jamestown, Virginia, in 1607, came to the New World to seek adventure or to better their condition in life; but others came for a different reason. Differences in religion had a good deal to do with sending people across the Atlantic, to settle in a land where they hoped to have more freedom. Those who preferred a simpler form of worship than was used in England were among the first to go, and gradually the fringe of English-speaking colonies spread along the coast of North America, to the Spanish settlements in Florida.

It was in 1620 that a little ship called the Mayflower crossed the stormy Atlantic, with about one hundred passengers on board. The long and miserable passage was no pleasure trip to the sad and earnest folk, and no warm welcome or comfortable quarters awaited them when at last they set foot on shore. But the granite boulder on which the feet of these Pilgrim Fathers, as they are called, first touched when they finally landed on American soil is still to be seen carefully railed round in front of the Pilgrim Hall in the town of Plymouth.

James himself was such a strange mixture of learning and stupidity that a brother king called him "The wisest fool in Christendom."

THE HANDSOME YOUNG PRINCE AND THE GIRL IN PICTURESQUE CLOTHES

When he died, it was his second son, Charles I., who succeeded him, for the promising, clever Henry, the friend of Raleigh, died before his father. Charles's handsome face is a very familiar one, for a famous painter, Van Dyck, lived in his reign, and painted many beautiful portraits, both of the king and his wife and their family. Very charming does Henrietta Maria look, with her girlish face framed in tiny curls, and very picturesque are her clothes. Unfortunately she was both young and foolish

THE STRONG RULE OF OLIVER CROMWELL



*This picture shows Oliver Cromwell at the head of his famous army of Ironsides, as the men were called, on the battlefield of Dunbar, where they scattered the Royal troops. Never was such an army as this, of which Cromwell said when the war was at an end, "Truly, they were never beaten at all." "Trust in God and keep your powder dry," was Cromwell's famous advice to his Ironsides when crossing a river one day.



After the death of King Charles, Oliver Cromwell ruled in England as Protector of the Commonwealth, and England rose to a proud position among the nations. But there were many troubles during the Commonwealth, and Cromwell ruled with an iron hand. This picture shows him angrily dissolving the Long Parliament, which had sat for twelve years and had supported the nation's rights against the king.

* Copyright by Photographische Gesellschaft. By permission of the Berlin Photographic Co., New York.

when she married, and she offended people in many ways.

The group of Stuart children is very interesting, and makes a delightful picture. There is the Prince of Wales, afterwards Charles II., when a boy of seven, with his hand on a splendid big dog; the Duke of York, afterwards James II., in a dress and cap that make him look like a girl; and Mary, a little copy of her mother, in her dress and curls, who afterwards married a Dutchman, the Prince of Orange.

THE KING'S MESSENGER BATTERED IN VAIN AT THE DOORS OF PARLIAMENT

As soon as Charles began his reign, he showed that he believed even more strongly than his father that, being a king, he could do no wrong, and was thus above all law and able to rule as he chose. Englishmen had been fighting for hundreds of years to make it certain that the sovereign of the country should rule by law, and Charles's doings roused the nation into steadfast resistance.

Imagine, for instance, this scene. Charles was angry at some remarks made in the House of Commons, and sent his messenger to summon the members to his presence to be rebuked. A great patriot, Eliot, sprang to his feet, and in blazing anger defended the right of free speech in the House. As he spoke the doors were locked, and the King's Messenger battered vainly outside. The Speaker, who rules the debate, was held down in his chair—because, being a friend of the king, he wanted to get out of it—so that the speaking might stop, and all the time, amid growing tumult and noise, loud cries of "Aye, aye!" supported Eliot in his claims for English liberty. He finished with words never forgotten: "None have gone about to break Parliaments, but in the end Parliaments have broken them."

BRAVE JOHN HAMPDEN, WHO REFUSED TO PAY THE KING'S TAX

Eliot died in prison because he refused to take back his words, and Charles dissolved Parliament, and ruled without one for nearly twelve years. During this time he trampled more and more heavily on the liberties of the country, and many people joined the Mayflower emigrants across the sea.

One of the many unjust things Charles did to exasperate the people was to force

money from them in ways not allowed by law. John Hampden, a country gentleman, refused to pay, and went to law with the king about it. The judges decided against him, to their deep disgrace; but the resistance of the brave man roused the nation to a still deeper sense of its danger. The growing anger of the people was like the mutterings of a storm, ever getting nearer and louder.

When at last Parliament was called together again, a great leader was found in Pym, who had the splendid gift of being able to speak so well that he could persuade men to do as he wished. The storm was getting louder. Now imagine the king bursting one day into the House of Commons in a rage, demanding that Pym and his friends should be given up to him! That caused the storm to break. The country rose and armed men to fight—the Parliament and the nation against the king and nobles.

At first Charles had the best of it. The brave Hampden was killed in one of the first battles, and for a time the Civil War raged, as in the times of the Roses, up and down all England.

THE COUNTRY GENTLEMAN WHO LEFT HIS FARM TO LEAD THE PEOPLE

There was a plain country gentleman, Oliver Cromwell, farming his rich grass meadows in Huntingdonshire, and traveling to London to sit in Parliament with Eliot and Pym, who now turned into a brilliant soldier, and raised a model army, one of the finest armies ever seen. He trained and disciplined them, and fired them with an intense desire to fight for their own religion and government. "Trust in God, and keep your powder dry," was his famous advice to them one day when crossing a river. They were able to meet the soldiers of Charles, long used to arms; and later their leader could say with pride, "Truly they never were beaten at all." These were the Ironsides.

It was they who turned the tide against Charles. He had to flee from Oxford, where he had kept up a gay Court, and at last fell into the hands of his enemies. His soldiers surrendered or fled; his possessions were captured; he was the poorest, the saddest man in the country. He was kept some time

at various castles, one being Carisbrooke Castle in the Isle of Wight, where we can still see the green where he played bowls, and the window from which he tried to escape. A little later he was taken to London.

Between Charing Cross and Westminster lies a very wide road; the statue of Charles I., on horseback, stands at the Charing Cross end of it. At the other end, close to the present Houses of Parliament, is the famous Westminster Hall, built by William Rufus. To this hall, every day for a week, Charles was taken, to be tried for taking away the liberties of the people. He was condemned to death. Half-way down the broad road is the Banqueting Hall of the Palace of Whitehall; outside one of the windows he was beheaded in the sight of his people. His dignity and charm made many people love him and pity his cruel fate.

For eleven years there was no king in England. It became a free state, in which the power of government rested with the people—a commonwealth. Both the Parliament and the Army were strong forces in these years; but the

man who really ruled the country was Oliver Cromwell, now called the Protector. He was a strong and determined man, and did his best to make England great by setting things in order at home, and extending her power abroad. The

great poet Milton was one of his Ministers.

After the death of Charles I. both Ireland and Scotland declared for his son, and Cromwell went to Ireland to put down rebellion there. So harsh and cruel were the measures he used, so terrible were the sufferings of the people, that to this day Cromwell's name is hated in Ireland, and the memories of the bitter struggle have not yet died out.

Charles's son tried to become king after his father's death, but Cromwell was too strong for him, and he was defeated at Worcester. The prince had to cut off his hair

and dress in a servant's clothes to escape being taken by Cromwell's men. For six weeks Prince Charles wandered about in great danger, and had many near escapes. One day he hid himself in an oak-tree, and actually heard the soldiers talking about how soon they

THE GREAT PLAGUE THAT FELL UPON LONDON



In the terrible times of the Stuarts, after the power of the Puritans had come to an end and Charles II. came to the throne, a great plague in London carried off thousands of men, women, and children. People fell ill so suddenly and died so quickly that no one was safe, and this picture, in which a child is being removed from the stricken city, helps us to understand the sadness of life in those times.

would catch him as they hunted about below him. But he escaped at last to a boat, and safely crossed the Channel, to wait in France for better times to come to England.

Some of the greatest names of the Commonwealth are held in remembrance by a plain stone close to the tomb of Henry VII., in Westminster Abbey, but

In the midst of a terrible storm, on the day that Cromwell considered his great day—for he had won two battles on that date—the great spirit of the Protector passed away. He was worn out in mind and body, so hard had been the task to guide the country through these troubled times.

His son Richard was a poor, feeble creature, and only ruled the country in name for a few weeks. One April, Cromwell sat on the throne of England; in May he wandered homeless, his trunk filled with congratulations from the monarchs of Europe. He came home at last to live in lodgings, and lived to be an old man.

There is a story told of a great pageant in which Queen Anne was the central figure. In the throng was an old man wearing the plain dress of a country farmer, and somebody, wondering how such a sight impressed a simple countryman, asked him, "Have you ever seen such a sight as that before?" "Never since I sat in her chair," said the old man. It was Cromwell's son, who had been all but king himself, and was then forgotten and unknown.

The name of Admiral Blake is another on the list. He was the first great seaman to have the honor of a grand funeral in Westminster Abbey. His remains now repose in the churchyard outside. The very mention of his name seems to make one feel the whistling of the wind in the sails, and the dashing of the salt sea spray. How with great skill and bravery he fought the Dutch from the Hebrides to the Channel, and how they fought him! After Spain lost its

THE STUARTS WELCOMED BACK TO ENGLAND



Charles's son tried to become king after his father's death; but Cromwell was too strong for him, and he fled to France to wait for better times. After eleven years he returned, and this picture shows him landing in England. The people, forgetting what they had suffered from the Stuarts, and having been ruled by Cromwell with a strong hand, welcomed Charles, and he became king.

their bodies are no longer there. There was Cromwell himself, with his friends, Ireton, his son-in-law, and Bradshaw, who was not afraid to say these bold words when Cromwell in great anger sent away the Long Parliament: "You mistake, sir, if you think the Parliament dissolved. No power on earth can dissolve the Parliament but itself; be sure of that."

funeral in Westminster Abbey. His remains now repose in the churchyard outside. The very mention of his name seems to make one feel the whistling of the wind in the sails, and the dashing of the salt sea spray. How with great skill and bravery he fought the Dutch from the Hebrides to the Channel, and how they fought him! After Spain lost its

THE TIMES OF THE STUARTS

sea power, the Dutch had held the first place, and great was the indignation of the veteran Van Tromp when Blake summoned his ship to salute the English flag. The fortune of war went up and down; now the Dutch forced Blake into the Thames, and swept the Channel, with a broom at the admiral's mast-head; now the English got the best of it in a running fight of four days.

• Presently Blake appeared in the Mediterranean, and from this time English merchants had a share of the Mediterranean trade, foreign merchants beginning to trust their goods to be carried by English vessels. When the fleet in the West Indies took from Spain the island of Jamaica, England entered into a world-wide struggle, which was to lay the foundations of a world-wide empire.

Blake's last and greatest feat was his destruction of the whole Spanish fleet in the harbor of Santa Cruz, in the island of Teneriffe. Not a single ship escaped, but all were sunk or burnt. Blake worked his own fleet out in the teeth of a gale. It is recorded that this great admiral did his best to make his sailors' lives more bearable, and that he was greatly beloved by them. He died as his ship entered Plymouth Harbor after his last victory.

General Monck lies buried near the tomb of Mary Queen of Scots, the unhappy mother of James I. He was the great soldier of the Commonwealth, and, besides fighting at sea with Blake, he helped Cromwell in Ireland and Scotland. It was he who, after Cromwell's death, took the chief part in

bringing back the son of Charles I. to rule over the kingdom as Charles II.

There had been many troubles during the Commonwealth; the Puritan party, to which Cromwell and his friends belonged, had been often overbearing and very disagreeable, and the people, forgetting what they had suffered from the Stuarts, hailed the change

THE LAST STUART KING DRIVEN OUT OF THE KINGDOM



The picture opposite shows us the Stuarts coming back to England. This picture shows us the last Stuart being driven out for ever. Charles II., after a bad reign, died, and in his place James II. became king. He, too, was a bad and useless king, and at length the people would have Stuart kings no longer to reign over them. James II. was defeated on the banks of the River Boyne, in Ireland, and here we see him making his escape.

with joy, thinking all would now go well.

Look at the group of the children of Charles I., and compare the faces of the two boys with their faces as grown men. There are many portraits of them, and their friends and courtiers, all with flowing, curly hair, fine velvet, and embroidered clothes. The Puritans

hated their pleasure-loving ways and smart clothes, and dressed themselves plainly, and cut their hair short. One of the greatest of the Puritans, John Bunyan, spent years in prison during Charles's reign for his religious opinions. While shut up away from his wife and little blind child, he wrote what has been called the most widely-read book in the English language next to the Bible—the Pilgrim's Progress. (See page 1125.)

King Charles's sympathies were all against the Puritans. He went as far as he dared in trying to take away rights and liberties from the country, but openly said that he would do nothing that would "send him again on his travels." A very important Act was passed in this reign by which no Englishman could ever be kept in prison without a trial.

THE GREAT PLAGUE OF LONDON AND THE FIRE THAT SWEEPED IT AWAY

In these times there occurred a great plague, a terrible disease which carried off thousands of men, women, and children. It was like the Black Death in the reign of Richard II., and people fell ill so suddenly, and died so quickly, that no one felt safe. It was a wonderful thing that in the year after this plague smote London there broke out the Great Fire, destroying any traces of the plague that might be left behind. The fire spread all over the centre of the city, from the Tower to the Temple Church, in 1666. The tall monument near London Bridge marks the spot where it broke out. A writer who saw it describes the stones of old St. Paul's Cathedral rattling down and the molten lead running along the streets in a stream, the very pavements glowing with fiery heat. Four hundred streets, over thirteen thousand dwelling-houses, and nearly a hundred churches were destroyed. The king and his brother did what they could to stop the progress of the flames, by blowing up houses with gunpowder, so making a gap which the fire could not cross. Dreadful as it all was, it really was best for London that its unhealthy streets should disappear.

So when the Great Fire swept away the streets in which there had been so much sickness and misery, a new and healthier city was built.

England was brought very low about the time of the plague and the fire. All that Elizabeth and Cromwell had tried

to do towards making it a power in Europe seemed to be undone by Charles II. in his dealings with foreign countries. He received a great deal of money from the powerful King of France, Louis XIV., for promising to help him to secure part of the Netherlands; he even sold him the town of Dunkirk, near Calais, which Cromwell took because it commanded the Channel.

HOW MEN DRIVEN FROM OTHER LANDS FOUNDED TRADE IN ENGLAND

Can you imagine the feelings of the country about this, and also when the war was so mismanaged that the Dutch sailed up the Thames itself and burnt the ships in the Medway? After this, for a time, it was the turn of the Dutch to sail proudly up and down the Channel, "monarchs of all they surveyed." Presently it was felt that France was getting too strong, and must not be allowed to encroach so much on Holland, and at last peace was made for a while.

All through the times of the Stuarts trade was growing. We have seen how the Flemish weavers helped to establish the wool trade; and more than once religious persecution in their own country sent away numbers of industrious men with their looms to set up in England, to its great profit. French silk weavers, too, sought refuge there, and started their beautiful work, chiefly in the East End of London. We read of Queen Elizabeth being delighted with a great novelty as a present—a pair of woven silk stockings.

THE WOODEN WALLS OF ENGLAND BEGIN TO RISE

In Stuart times, frames for knitting were set up in the towns of Leicester and Nottingham, where now there are thousands of workers in the great mills. The linen and cotton trades, too, began to employ workers, though in a very small way, and most of the cotton brought from abroad was used to make candle-wicks.

In this seventeenth century coal began to be used in houses, chiefly in London, as it could easily come by water from Newcastle. People began to use it also to obtain heat for smelting iron, instead of wood. It was feared that before long all the forests would be cut down, for it took two loads of wood to make one load of charcoal, and two loads of charcoal to make one ton of iron.

Birmingham started to be a manufacturing town in that same century, ships were built on a large scale, and at the end of the century England was possessed of double the vessels that she had when the little "sea hawks" poured out of the harbors to tackle the Armada. Dockyards sprang up, such as those at Deptford and Woolwich, where the saw and the hammer were busily used in making the wooden walls of Old England.

JAMES II. LOSES HIS THRONE AND HIS QUEEN ESCAPES WITH HER BABY

When Charles II. died, his sailor brother became king, as James II. He took money from the French king, as Charles II. had done, and there were many struggles and tumults, both with the people and the bishops, about the things James did contrary to law, which interfered with the rights of the people. As we look at his heavy face we can understand his want of tact, and his failure in governing his people. In a short time they could stand him no longer, and William of Orange, who had married his eldest daughter, Mary, was invited from Holland to take his place.

James's wife, Mary of Modena, fled to France with her baby boy under her cloak, under cover of night, when her husband lost his throne. When the baby grew up, his friends called him James III., but those who were against him called him the Old Pretender, because he claimed, or made pretence, to be king. Both he and his son after him, called the Young Pretender, or Bonnie Prince Charlie, made many attempts to get back the throne which James had lost, but they all failed, and the succession remained with his two elder daughters, who were Protestants.

THE POWER OF PARLIAMENT IS ESTABLISHED FOR ALL TIME

A very important Act was passed at the beginning of William and Mary's reign, to make quite clear for the future what power the sovereign of the country should possess. The old principles that we have seen fought for over and over again since the time of John came up once more—that Parliament must make and unmake laws; that Parliament must settle what taxes are to be paid; that speech in Parliament must be free.

The French helped James to make a

last stand in Ireland, where William won the battle of the Boyne. For nearly ten years fighting went on with France. The Scots were against William for some time, but gave in when they saw it was useless to try to get James or his son back.

Mary's sister, Anne, became queen next. A great war broke out during the same year with France. The old king, Louis XIV., who had driven out the silk weavers, had bribed Charles II. and his brother, had helped James II. and fought William III., now wished that his grandson, the King of Spain, should also succeed to the French throne; but as this would have given too much power to one man in Europe, England, Holland, and most of the German princes united to prevent it.

"Patience will conquer all things," was the Duke of Marlborough's favorite motto, and the victories of this time for which he is famous are amongst the greatest in any history. They decided that the two crowns of France and Spain should not be united, and that the Stuart Pretender should not be helped any more. England also obtained the right of sending one ship a year to the South Seas. Who can count how many she sends there now?

ENGLAND AND SCOTLAND ARE UNITED AS ONE NATION

In the midst of the war, the final union of England and Scotland was completed, to the great gain of both countries. The name was henceforth Great Britain. The Scottish National Church and the old Scottish laws were left untouched; the Parliaments were united, and trade was thrown open. On the one side the English gained much from the friendship and help of the Scotch, and the Scotch had better chances to enlarge their trade and get their country into good order.

The meeting of the first British Parliament was a grand affair. Each Scottish lord was led to his place by two English lords, and Queen Anne, in her fine robes, made a speech of welcome.

The flag-makers must have been busy, for the white cross of St. Andrew on a blue ground had to be added to the red cross of St. George on a white ground. But the Union Jack was not yet complete.

THE NEXT STORY OF ENGLAND BEGINS ON PAGE 1113

IN MARCHED A TROOP OF LITTLE MEN



An hour before daybreak the window opened and in marched a troop of little men, clothed in crimson and gold. They marched up to the dog, and said, "What will your highness be pleased that we do?"

The Book of STORIES

GRANNY'S WONDERFUL CHAIR

FRANCES BROWNE was born in a village in Ireland about a hundred years ago, and she was blind. She lived a sad childhood in blindness and loneliness, but she had a wonderful mind and made up fine stories. In one of her stories is a little girl named Snowflower, with a very old grandmother called Dame Frostyface, who sat in an old armchair, and told little Snowflower the most wonderful tales. One morning Dame Frostyface went away on a long, long journey where she could not take Snowflower with her. "When you are lonely," she said to Snowflower, "lay your head down on the cushion of the armchair and say, 'Chair of my grandmother, tell me a story.'" And many a day after that little Snowflower laid her head on Granny's wonderful chair and listened to the tales it told. Frances Browne put them into a book, and these stories are from her book.

THE STORY OF CHILD CHARITY

ONCE upon a time there lived a little girl who had neither father nor mother; they both died when she was very young, and left their daughter to the care of her uncle, who was the richest farmer in all that country. He had houses and lands, flocks and herds, many servants to work about his house and fields, a wife who had brought him a great dowry, and two fair daughters.

Now, it happened that though she was their near relation, they despised the orphan girl, partly because she had no fortune, and partly because of her humble, kindly disposition. It was said that the more needy and despised any creature was, the more ready was she to befriend it; on which account the people of the West Country called her Child Charity. Her uncle would not own her for his niece, and her aunt sent her to work in the dairy, and to sleep in the back garret. All the day she scoured pails, scrubbed dishes, and washed crockery-ware; but every night she slept in the back garret as sound as a princess could sleep in her palace.

One day during the harvest season,

CONTINUED FROM 980

when this rich farmer's grain had been all cut down and housed, he invited the neighbors to a harvest supper. The West-country people came in their holiday clothes, and they were making merry, when a poor old woman came to the back door, begging for broken victuals and a night's lodging. She was the poorest and ugliest old woman that ever came begging. The first who saw her was the kitchen-maid, and she ordered her off; but Child Charity came out from her seat at the foot of the lowest table, and asked the old woman to take her share of the supper, and sleep that night in her bed in the back garret. The old woman sat down without a word of thanks. Child Charity scraped the pots for her supper that night, and slept on a sack among the lumber, while the old woman rested in her warm bed; and next morning, before the little



Snowflower laid her head on Granny's wonderful chair.

girl awoke, she was up and gone, without so much as saying thank you.

Next day, at supper-time, who should come to the back door but the old woman, again asking for broken victuals and a night's lodging. No one would listen to her, till Child Charity rose from her seat and kindly asked her to take her supper, and sleep in her bed in the back garret. Again the old woman sat down without a word. Child Charity scraped the pots for her supper, and slept on the sack. In the morning the old woman was gone; but for six nights after, as sure as the supper was spread, there was she at the door, and the little girl regularly asked her in.

Sometimes the old woman said, "Child, why don't you make this bed softer? and why are your blankets so thin?" But she never gave her a word of thanks nor a civil good-morning. At last, on the ninth night from her first coming, her accustomed knock came to the door, and there she stood with an ugly dog.

"Good-evening, my little girl," she said, when Child Charity opened the door. "I will not have your supper and bed to-night—I am going on a long journey to see a friend; but here is a dog of mine, whom nobody in all the West Country will keep for me. He is a little cross, and not very handsome; but I leave him to your care till the shortest day in all the year."

When the old woman had said the last word, she set off with such speed that Child Charity lost sight of her in a minute. The ugly dog began to fawn upon her, but he snarled at everybody else. It was with great trouble that Child Charity got leave to keep him in an old ruined cow-house. The little girl gave him part of all her meals, and when the hard frost came, took him privately to her own back garret, because the cow-house was damp and cold in the long nights. The dog lay quietly on some straw in a corner.

Child Charity slept soundly, but every morning the servants said to her:

"What great light and fine talking was that in your back garret?"

"There was no light but the moon shining in through the shutterless window, and no talk that I heard," said Child Charity, and she thought they must have been dreaming! But night after night, when any of them awoke in the dark, they saw a light brighter and clearer than the Christmas fire, and heard voices like those of lords and ladies in the back garret.



Child Charity scraped the pots for supper.

At length, when the nights were longest, the little parlor-maid crept out of bed when all the rest were sleeping, and set herself to watch at the keyhole. She saw the dog lying quietly in the corner, Child Charity sleeping soundly in her bed, and the moon shining through the shutterless window; but an hour before daybreak the window opened, and in marched a troop of little men clothed in crimson and gold. They marched up with great reverence to the dog, where he lay on the straw, and the most richly clothed among them said:

"Royal prince, we have prepared the banquet hall. What will your highness please that we do next?"

"You have done well," said the dog. "Now prepare the feast, and see that all things are in the best style; for the princess and I mean to bring a stranger who never feasted in our halls before."

"Your highness's commands shall be obeyed," said the little man, making another reverence; and he and his company passed out of the window. By-and-by there came in a company of little ladies clad in rose-colored velvet, and each carrying a crystal lamp. They also walked with great reverence up to the dog, and the gayest among them said:

"Royal prince, we have prepared the tapestry. What will your highness please that we do next?"

"You have done well," said the dog. "Now prepare the robes, and let all things be in the best style, for the princess and I will bring with us a stranger who never feasted in our halls before."

"Your highness's commands shall be obeyed," said the little lady, making a low curtsy; and she and her company passed out through the window, which closed quietly behind them. The dog stretched himself out upon the straw, the little girl turned in her sleep, and the moon shone in on the back garret. The parlor-maid was much amazed, and told the story to her mistress; but her mistress called her a silly girl to have such foolish dreams, and scolded her.

Still, Child Charity's aunt thought there might be something in it worth knowing; so next night, when all the house was asleep, she crept out of bed, and watched at the back garret door. There she saw exactly what the maid had told her.

The mistress could not close her eyes any more than the maid from eagerness to tell the story. She woke up Child Charity's rich uncle before daybreak; but when he heard it he laughed at her for a foolish woman. But that night the master set himself to watch at the crevice in the door. The same thing happened again.

The master could not close his eyes any more than the maid or the mistress for thinking of this strange sight. He remembered having heard his grandfather say that somewhere near his meadows there lay a path leading to the fairies' country, and he concluded that the doings in his back garret must be fairy business, and the dog a very important person.

Accordingly, he made it his first business that morning to get ready a fine breakfast of roast mutton for the ugly dog, and carry it to him in the old cow-house; but not a morsel

would the dog taste. On the contrary, he snarled at the master.

Just as the family were sitting down to supper that night, the ugly dog began to bark, and the old woman's knock was heard at the back door. Child Charity opened it, when the old woman said:

"This is the shortest day in all the year, and I am going home to hold a feast after my travels. I see you have taken good care of my dog, and now, if you will come with me to my house, he and I will do our best to entertain you. Here is our company."

As she spoke a great company, clad so grandly that they shone with gold and jewels, came in open chariots, covered with gilding and drawn by snow-white horses. The first and finest of the chariots was empty. The old woman led Child Charity to it by the hand, and the ugly dog jumped in before her. No sooner were the old woman and her dog within the chariot than a marvelous change passed over them, for the old woman turned at once to a beautiful young princess, while the ugly dog at her side became a fair young prince, with



There came in a company of little ladies clad in rose-colored velvet.

nut-brown hair and a robe of purple and silver.

"We are," said they, as the chariots

drove on and the little girl sat astonished, "a prince and princess of Fairyland, and there was a wager between us whether or not there were good people still to be found in these false and greedy times. One said 'Yes,' and the other said 'No'; and I have lost," said the prince, "and must pay for the feast and presents."

Child Charity went with that noble company into a country such as she had never seen. They took her to a royal palace, where there was nothing but feasting and dancing for seven days. She had robes of pale-green velvet to wear, and slept in a chamber inlaid with ivory. When the feast was done, the prince and princess gave her such

heaps of gold and jewels that she could not carry them, but they gave her a chariot to go home in, drawn by six white horses, and on the seventh night, when the farmer's family had settled in their own minds that she would never come back, and were sitting down to supper, they heard the sound of her coachman's bugle, and saw her alight with all the jewels and gold at the very back door where she had brought in the ugly old woman. The fairy chariot drove away, and never came back to that farmhouse after. But Child Charity scrubbed and scoured no more, for she became a great and rich lady.



THE GREEDY SHEPHERD

ONCE upon a time there lived in the South Country two brothers, whose business it was to keep sheep. No one lived on that plain but shepherds, who watched their sheep so carefully that no lamb was ever lost.

There was none among them more careful than these two brothers, one of whom was called Clutch, and the other Kind. Though brothers, no two men could be more unlike in disposition. Clutch thought of nothing but how to make some profit for himself, while Kind would have shared his last morsel

with a hungry dog. This covetous mind made Clutch keep all his father's sheep when the old man was dead, because he was the eldest brother, allowing Kind nothing but the place of a servant to help him in looking after them.

For some time the brothers lived peaceably in their father's cottage, and kept their flock on the grassy plain, till new troubles arose through Clutch's covetousness.

One midsummer it so happened that the traders praised the wool of Clutch's flock more than all they found on the plain, and gave him the highest price for it. That was an unlucky thing for the sheep, for after that Clutch thought he could never get enough wool off them. At shearing time nobody clipped so close as Clutch, and, in spite of all Kind could do or say, he left the poor sheep as bare as if they had been shaven.

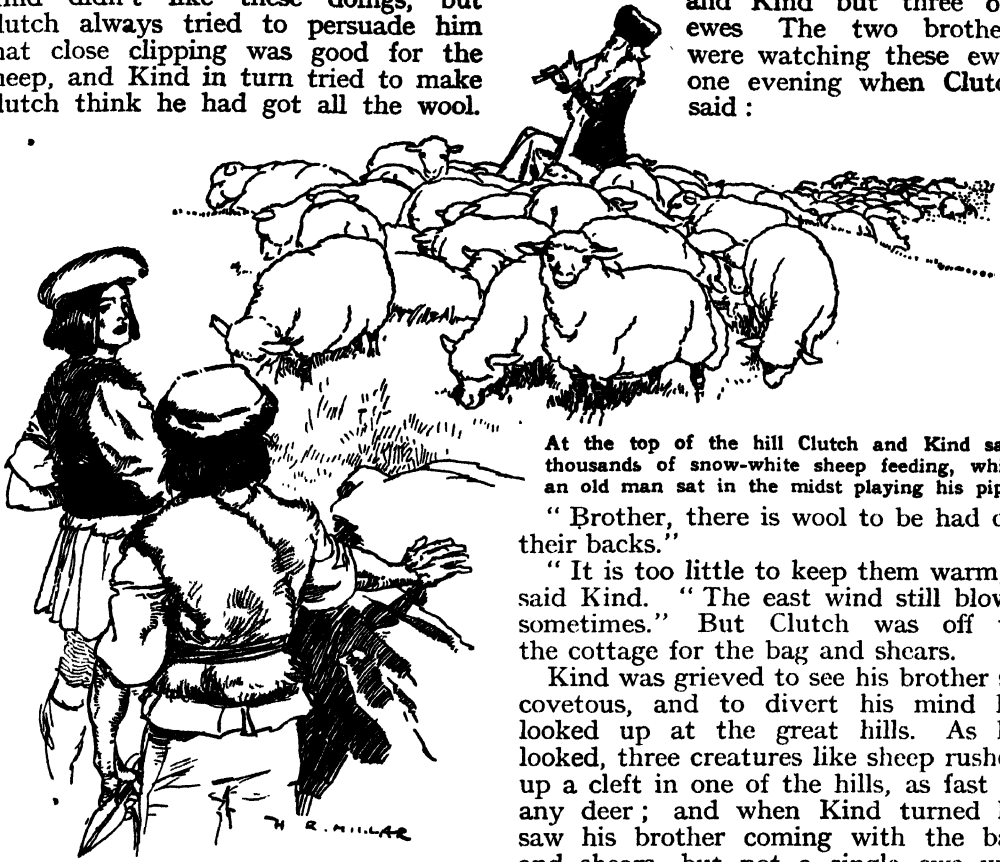


Clutch kept all his father's sheep when the old man died, and, when shearing, Clutch clipped so close that he left the poor sheep as bare as if they had been shaven.

◆ THE GREEDY SHEPHERD ◆

Kind didn't like these doings, but Clutch always tried to persuade him that close clipping was good for the sheep, and Kind in turn tried to make Clutch think he had got all the wool.

and Kind but three old ewes. The two brothers were watching these ewes one evening when Clutch said :



At the top of the hill Clutch and Kind saw thousands of snow-white sheep feeding, while an old man sat in the midst playing his pipe.

" Brother, there is wool to be had on their backs."

" It is too little to keep them warm," said Kind. " The east wind still blows sometimes." But Clutch was off to the cottage for the bag and shears.

Kind was grieved to see his brother so covetous, and to divert his mind he looked up at the great hills. As he looked, three creatures like sheep rushed up a cleft in one of the hills, as fast as any deer ; and when Kind turned he saw his brother coming with the bag and shears, but not a single ewe was to be seen. Clutch's first question was, what had become of them ; and when Kind told him what he saw, the eldest brother scolded him for no watching better.

" Now we have not a single sheep," he said, " and the other shepherds will hardly give us room among them at shearing time or harvest. If you like to come with me, we shall get service somewhere. I have heard my father say that there were great shepherds living in old times beyond the hills ; let us go and see if they will take us for sheep-boys."

Accordingly, next morning Clutch took his bag and shears, Kind took his crook and pipe, and away they went over the plain and up the hills. All who saw them thought that they had lost their senses, for no shepherd had gone there for a hundred years, and nothing was to be seen but wide moorlands, full of rugged rocks, and sloping up, it seemed, to the very sky.

Still Clutch sold the wool, and stored up his profits, and one midsummer after another passed. The shepherds began to think him a rich man, and close clipping might have become the fashion but for a strange thing which happened to his flock.

The wool had grown well that summer. He had taken two crops off the sheep, and was thinking of a third, when first the lambs, and then the ewes, began to stray away ; and, search as the brothers would, none of them was ever found again. The flocks grew smaller every day, and all the brothers could find out was that the closest clipped were the first to go.

Kind grew tired of watching, and Clutch lost his sleep with vexation. The other shepherds, to whom he had boasted of his wool and his profits, were not sorry to see pride having a fall. Still the flock melted away as the months wore on, and when the spring came back nothing remained with Clutch

By noon they came to the stony cleft up which the three old ewes had raced like deer; but both were tired, and sat down to rest. As they sat there, there came a sound of music down the hills as if a thousand shepherds were playing on their pipes. Clutch and Kind had never heard such music before, and, getting up, they followed the sound up the cleft, and over a wide heath, till at sunset they came to the hill-top, where they saw a flock of thousands of snow-white sheep feeding, while an old man sat in the midst of them playing merrily on his pipe.

"Good father," said Kind, for his eldest brother hung back and was afraid, "tell us what land is this, and where we may find service; for my brother and I are shepherds, and can keep flocks from straying, though we have lost our own."

"These are the hill pastures," said the old man, "and I am the ancient shepherd. My flocks never stray, but I have employment for you. Which of you can shear best?"

"Good father," said Clutch, taking courage, "I am the closest shearer in all the plain country; you would not find enough wool to make a thread on a sheep when I have done with it."

"You are the man for my business," said the old shepherd. "When the moon rises, I shall call the flock you have to shear."

The sun went down and the moon rose, and all the snow-white sheep laid themselves down behind him. Then up the hills came a troop of shaggy wolves, with hair so long that their eyes could scarcely be seen. Clutch would have fled for fear, but the

wolves stopped, and the old man said:

"Rise and shear—these sheep of mine have too much wool on them."

Clutch had never shorn wolves before, yet he went forward bravely; but the first of the wolves showed its teeth, and all the rest raised such a howl that Clutch was glad to throw down his shears and run behind the old man for safety.

"Good father" cried he, "I will shear sheep, but not wolves!"

"They must be shorn," said the old man, "or you go back to the plains, and they after you; but whichever of you can shear them shall have the whole flock."

On hearing this, Kind caught up the shears Clutch had thrown away in his fright, and went boldly up to the nearest wolf. To his great surprise, the wild creature seemed to know him, and quietly allowed itself to be shorn. Kind clipped neatly, but not too closely, and when he had done with one, another

came forward, till the whole flock were shorn. Then the man said:

"You have done well; take the wool and the flock for your wages, return with them to the plain, and take this brother of yours for a boy to keep them."

Kind did not much like keeping wolves, but before he could answer they had all changed into the very sheep which had strayed away, and the hair he had cut off

was now a heap of fine, soft wool.

Clutch gathered it up in his bag, and went back to the plain with his brother. They keep the sheep together till this day, but Clutch has grown less greedy, and Kind alone uses the shears.



Kind clipped neatly but not too closely.

THE FACE NO MAN COULD LOOK ON

THE MARVELOUS ADVENTURES OF PERSEUS

AN old fisherman was fishing one evening on the Greek island of Seriphos, when he saw a strange sight. A chest came floating in on the waves, and in the chest sat a beautiful lady, nursing a pretty little boy.

"Save me and help me!" cried the lady. "I am Danae, the daughter of the King of Argos, and this child is my son Perseus. My father has driven us forth like this because of an evil prophecy that Perseus should bring about his death."

The kind old fisherman took Danae and Perseus to his house, and there they stayed with him until Perseus was old enough to earn his own living. Then he became a sailor, and grew strong and hardy. At the age of fifteen he was a very remarkable lad. He stood a head taller than any man on the island, and he was the champion in every kind of warlike sport. And he had need to be, for, on returning from one of his voyages, he found that his mother was gone.

"The King of Seriphos has fallen madly in love with her," said the old fisherman. "And, as she will not marry him, he has imprisoned her."

Perseus strode into the palace, his eyes blazing with anger, and there he discovered his mother, and set her free. For he looked so terrible that no man dared oppose him. And he was about to kill the king, when his mother said:

"Perseus, we are strangers in this place. If you harm the king all the people will attack you."

So Perseus spared the king, but the king laid a plot to get rid of the brave boy, and force the mother to become his wife. He prepared a great feast, and invited all his lords; and he also invited Perseus. Now, it was a custom on these occasions for every guest to bring the king some costly gift; but, as Perseus was a poor sailor lad, he came to the feast with nothing to give. And when the time came to present the gifts, all the lords scoffed at him. But Perseus then remembered a

strange vision which he had had. Athene, the Spirit of Wisdom, had come to him in a dream, and she had told him to go forth and slay her enemy the Gorgon, and she had promised to help him. So when the lords scoffed, he cried:

"Wait, and I will bring the king such a gift as no man has ever seen. I will bring him the head of the Gorgon."

"Go, then," said the king, "and never return until you bring it."

He thought that he had sent Perseus to a certain death. For the Gorgon was a terrible woman, with a face on which no mortal could gaze without turning into stone. But Perseus went down to the cliff by the sea and waited, and Athene again appeared to him, and with her came another spirit, called Mercury. And she gave Perseus her great polished shield, and Mercury gave him his magic sandals and his enchanted sword.

"My enemy the Gorgon," said Athene, "dwells in the cold lands where the north wind blows. Go there and attack



PERSEUS RESCUES THE BEAUTIFUL PRINCESS

her. But beware of looking at her face. Watch the reflection of it on my polished shield, and turn your eyes away when you strike her. Now put on the sandals, and leap off the cliff."

Perseus did so, and, instead of falling into the sea, he began to travel with great swiftness along the air on the magic sandals. On and on he went, until he came to the desolate place where the Three Grey Sisters dwelt. And the Three Grey Sisters told him to turn southwards, and go to the Garden of the Hesperides. And Perseus turned southwards, and came to the Sunset Land, where the Hesperides lived. And he saw the young and beautiful Hesperides singing and dancing in their garden around an enchanted tree laden with golden fruit. And one of these lively nymphs took pity on the brave, handsome lad, and said to him :

"The Gorgon will turn you into stone if she is able to see you. You must wear the Hat of Darkness, and then you will be invisible."

And she went down into the Underworld, and brought Perseus the Hat of Darkness; and Perseus put it on, and became invisible. He then traveled on the magic sandals to the cold land from which the north wind blows. There he held up the polished shield, and looking into it he saw the Gorgon sleeping beside her sisters on an island.

Her face was pale and beautiful, but instead of hair she had serpents growing out of her head. The serpents could not see Perseus because he wore the Hat of Darkness, and he came close up to the Gorgon, looking all the time at the reflection in the polished shield; and

then, with one stroke of the sword, he cut off her head, and, still without looking at it, he wrapped it in a goatskin. Then, before the two sisters of the Gorgon could seize him, he mounted a winged horse named Pegasus, which sprang from her blood, and soared up, and traveled to the land of Iopa. Seeing a white statue standing under a black rock by the shore, he descended, and found that it was a beautiful girl chained there, and the girl cried :

"Do not set me free. I am Andromeda, the daughter of the Queen of Iopa, and I am chained here as a sacrifice. For my mother boasted that I was fairer than the Queen of the Sea, and the Queen of the Sea has sent a sea-beast to ravage Iopa. Only by offering me as a sacrifice can the land be saved."

But, when the monster appeared, Perseus unveiled the head of the Gorgon, and the monster saw it, and turned into a great, long stone. He then married Andromeda, and sailed with her to the island of Seriphos.

"Ha, you braggart castaway!" cried the king. "So you find it easier to make a promise than to fulfil it?"

Perseus showed the head of the Gorgon, and at the sight of it the king and all his scoffing lords were turned into stone. Perseus then made the kind old fisherman King of Seriphos, and led his mother to the ship, and sailed with her and his lovely wife to Argos.

And there, after killing his grandfather by accident while playing quoits, as it had been prophesied, he settled down with Andromeda and his mother, and the people made him king of the land.

THE YELLOW DWARF

THE STORY OF PRINCESS BEAUTIFUL AND THE KING OF THE GOLDEN MINES

PRINCESS BEAUTIFUL was the loveliest maiden on earth. All the great rulers in the world desired to marry her, and at last she was wooed and won by the brave young King of the Golden Mines.

But just before the wedding-day the king fell ill. No doctor was able to cure him, so the mother of the princess resolved to get a magic remedy from the

Fairy of the Emerald Palace who lived by the seashore at the end of a valley that was guarded by two lions. As the lions ate up everybody who did not feed them with a certain kind of cake that they liked, the mother of the princess took some of this cake with her in a basket. On reaching the valley, she felt very tired, and fell asleep beneath a tree. But suddenly she was awakened by the roar-

THE YELLOW DWARF SITS IN THE TREE



"Ha, ha!" said someone in the tree. The mother of the princess looked up and saw a dwarf sitting amid the leaves with the cake in his hand. "Give me my cake," she cried. "or the lions will eat me up!"

ing of the lions, and, picking up her basket, she found, to her horror, that the cake was gone!

"Ha, ha!" said somebody in the tree above her head.

She looked up, and saw an ugly yellow dwarf sitting amid the leaves with the cake in his hand.

"Oh, give me my cake," she cried, "or the lions will eat me up!"

"Yes," said the Yellow Dwarf, "if you will give me your daughter in marriage."

She determined to die rather than consent to this. But when the two lions rushed upon her she was terrified, and said:

"Give me the cake, and marry my daughter!"

The Yellow Dwarf gave her the cake, and she fed the lions with it, and they let her pass unharmed. She then went through the valley to the Emerald Palace by the seashore, and obtained from the fairy the magic remedy, and with this she returned home and quickly cured the brave young King of the Golden Mines.

"Now, if I hasten on the marriage between the two lovers," she said to herself, "the Yellow Dwarf will be foiled!"

So preparations were at once made for the ceremony. Princess Beautiful and the King of the Golden Mines were as merry as singing birds in the month of May, but the mother of the princess was pale with anxiety, though she had seen or heard nothing of the Yellow Dwarf. On the way to the cathedral she kept urging the coachman to drive faster. But all her haste was useless.

"Ha, ha!" said somebody, when the wedding procession arrived at the cathedral.

The mother of the princess looked up, and saw the Yellow Dwarf sitting above the porch. Before she could utter a warning, he swooped down through the air, seized Princess Beautiful and disappeared.

The king, too, was lifted up and whirled away. When he recovered, he found himself in the Emerald Palace of the fairy, for having come to the cathedral to help the Yellow Dwarf, she had fallen in love with the king at first sight, and carried him off.

The fairy did all that she could to win the heart of the king. She gave him the finest suite of rooms in the Emerald Palace, and held all kinds of balls and festivals there in his honor. But he used to wander sadly all day long by the seashore.

One morning a lovely woman swam up to him. As she approached he saw that she was a mermaid and had a fish's tail.

"Ah, King," she said, "you and Princess Beautiful are indeed an unhappy pair of lovers. The Yellow Dwarf has carried her to his castle on the other side of the sea, and, like you, she wanders sadly all day long by the shore."

"Can you take me to her?" cried the king.

"If you will sit on my tail," said the mermaid.

The king did so, and the mermaid swam with him across the sea to the castle of the Yellow Dwarf. Then she gave him a diamond sword, and said:

"Never let go of this sword until you have won the princess."

On arriving at the castle, the king was attacked by four unicorns. Placing his back against a great oak, he let them rush upon him and drive their long, sharp horns at him. But just as they were about to pierce him, he dropped down, and crash! went the four horns into the tree, and there the unicorns remained fixed while he killed them with the diamond sword.

At the gate of the castle he found Princess Beautiful, and threw himself at her feet. But in doing so he let go of the diamond sword, and the Yellow Dwarf, who was watching behind the gate, sprang out and picked it up, and said:

"Princess, the time has come for you to make your choice. Marry me, and I will let the king depart unharmed; or refuse to marry me, and I will slay him!"

"I will marry you!" said the princess.

In his joy the Yellow Dwarf also let go of the diamond sword, and the king snatched it up and cut off his head.

Then the lovers returned to the mother of the princess, and this time the marriage took place.

THE NEXT STORIES BEGIN ON PAGE 1077.

The Book of POETRY



POETRY OF YOUTH AND MANHOOD

YOUTH is a period that lasts but a few years; a period of splendid visions. We see everything about us in the rosy light of happiness and hopefulness.

We think that all our wishes are to come true. Later, when the light in which we see things is less rosy, when all our fond wishes have not come to pass, we need not be less happy; but we shall be more wise, and realize that we wished impossible things. Yet it is only by having hope that we can do anything worth doing in this world, and youth gives us hope, which, if backed up by labor and effort, may enable us to do worthy things.

There are many poems of youth, but perhaps none so well known, and certainly none that sounds the steadfast note of high endeavor so clearly, as Longfellow's "Excelsior," given on page 715. The spirit of youth is also felt in much good poetry that makes no direct appeal to young people; and this is because so many of the great poets began to write while still in their teens. Pope, Byron, Tennyson, and many more, wrote remarkable poems while they themselves were still youths. And as youth is also a time when the heart is care-free and generous, most of the poetry written by the poets in their earlier years is full of noble sympathy for their fellow creatures, of enthusiasm for every good cause.

CONTINUED FROM 929



It has been said that the poetry of childhood and youth may be summed up in the phrase, "When I am a Man," whereas the poetry of manhood may be summed up in the phrase, "When I was young." To some extent

this is true; but it would be more correct to say that "When I was young" is the poetry of old age. For, while youth is the period of hope, manhood is the time of achievement; in old age comes reflection.

Now, we have noticed certain things about English poetry that make it remarkable, and there is a natural consequence of these. Their poets love nature and they sing the praise of childhood and youth, so it follows that they cannot but hold up a lofty ideal of manhood. There is nothing mean or ignoble in the manhood that is praised by English poets. And here the word English includes Scottish, Irish, and American. All the literature originally in the English language is English literature. But the Scottish poets sometimes use the old-fashioned Scottish tongue, as Burns does in a famous song about manhood:

The rank is but the guinea stamp,
The man's the gowd (gold) for a' that.

Manhood, of course, includes every aspect of duty and conduct, and we shall see in due course that English poetry may inspire us to the best that manhood can achieve.

SIR GALAHAD

Alfred Lord Tennyson, who was for many years Poet Laureate of England, wrote many wonderful poems, but none more beautiful than the "Idylls of the King," and "Sir Galahad" rings with a manly vigor tempered by a gentleness of feeling that characterizes the true knight as well as the true man.

MY good blade carves the casques of men,
My tough lance thrusteth sure,
My strength is as the strength of ten,
Because my heart is pure.
The shattering trumpet shrilleth high,
The hard brands shiver on the steel,
The splintered spear-shafts crack and fly,
The horse and rider reel:
They reel, they roll in clanging lists,
And when the tide of combat stands,
Perfume and flowers fall in showers,
That lightly rain from ladies' hands.

How sweet are looks that ladies bend
On whom their favours fall!
For them I battle till the end,
To save from shame and thrall:
But all my heart is drawn above,
My knees are bowed in crypt and shrine:
I never felt the kiss of love,
Nor maiden's hand in mine.
More bounteous aspects on me beam,
The mightier transports move and thrill;
So keep I fair thro' faith and prayer
A virgin heart in work and will.

* * * * *

When on my goodly charger borne
Thro' dreaming towns I go,
The cock crows ere the Christmas morn,
The streets are dumb with snow.
The tempest crackles on the leads,
And, ringing, springs from brand and mail,
But o'er the dark a glory spreads,
And gilds the driving hail.
I leave the plain, I climb the height;
No branchy thicket shelter yields;
But blessed forms in whistling storms
Fly o'er waste fens and windy fields.

A maiden knight—to me is given
Such hope, I know not fear;
I yearn to breathe the airs of heaven
That often meet me here.
I muse on joy that will not cease,
Pure spaces clothed in living beams,
Pure lilies of eternal peace,
Whose odours haunt my dreams;
And, stricken by an angel's hand,
This mortal armour that I wear,
Th' is weight and size, this heart and eyes,
Are touched, and turned to finest air.

The clouds are broken in the sky,
And thro' the mountain walls
A rolling organ-harmony
Swells up, and shakes and falls,
Then move the trees, the copses nod,
Wings flutter, voices hover clear;
"O just and faithful knight of God!
Ride on! the prize is near."
So pass I hostel, hall, and grange;
By bridge and ford, by park and pale,
All-armed I ride, whate'er betide,
Until I find the holy Grail.

PROSPICE

In another part of this work we have given the beautiful poem "Crossing the Bar," which was Alfred Lord Tennyson's farewell to life. Here we quote "Prospice," by Robert Browning, the noblest swan-song that has ever been written.

FEAR death?—to feel the fog in my throat,
The mist in my face,
When the snows begin, and the blasts denote
I am nearing the place,
The power of the night, the press of the storm,
The post of the foe;
Where he stands, the Arch Fear in a visible form.
Yet the strong man must go:
For the journey is done and the summit attained,
And the barriers fall,
Though a battle's to fight ere the guerdon be gained,
The reward of it all.
I was ever a fighter, so—one fight more,
The best and the last:
I would hate that death bandaged my eyes, and forbore,
And bade me creep past.
No! let me taste the whole of it, fare like my peers
The heroes of old,
Bear the brunt, in a minute pay glad life's arrears
Of pain, darkness and cold.
For sudden the worst turns the best to the brave,
The black minute's at end,
And the elements' rage, the fiend voices that rave,
Shall dwindle, shall blend,
Shall change, shall become first a peace out of pain,
Then a light, then thy breast,
O thou soul of my soul! I shall clasp thee again,
And with God be the rest!

DIRGE FOR A SOLDIER

An American, George Henry Boker, wrote this martial dirge for the soldier whose work was finished. He had done his duty, and had willingly laid down his life for his country and his flag

CLOSE his eyes; his work is done!
What to him is friend or foeman,
Rise of moon or set of sun,
Hand of man or kiss of woman?
Lay him low, lay him low,
In the clover or the snow!
What cares he? he cannot know;
Lay him low!

Fold him in his country's stars.
Roll the drum and fire the volley!
What to him are all our wars?—
What but death bemoeking folly?
Lay him low, lay him low,
In the clover or the snow!
What cares he? he cannot know;
Lay him low!

As man may, he fought his fight,
Proved his truth by his endeavour;
Let him sleep in solemn night,
Sleep for ever and for ever.
Lay him low, lay him low,
In the clover or the snow!
What cares he? he cannot know;
Lay him low!

THE END OF LIFE

We seldom have blank verse in our Book of Poetry, for reasons which were explained on page 102. The following extract is in blank verse, and is taken from a very long poem called "Festus," which had a great success in the days of our grandfathers, but is seldom read now. It was written by Philip James Bailey, who was born in 1816 and died in 1902. These lines teach us that action should be the purpose of our life.

WE live in deeds, not years ; in thoughts, not
breaths ;
In feelings, not in figures on a dial.
We should count time by heart-throbs. He
most lives
Who thinks most, feels the noblest, acts the
best.
• And he whose heart beats quickest, lives the
longest ;
Lives in one hour more than in years do some
Whose fat blood sleeps as it slips along their
veins.
Life is but a means unto an end ; that end,
Beginning, mean, and end to all things—God.

WISHING

We have already read several of the tuneful little poems by William Allingham. This is another by the same writer. "Wishing" is, indeed, a profitless occupation ; but if we have fancy or imagination we cannot help "wishing" at times, and, after all, though we have always to come back to the facts of our daily life, just as "the rover" returned for his mother's kiss, if we are wise we shall find that the things we have are usually those that for us are best worth having.

RING-TING ! I wish I were a Primrose,
A bright yellow Primrose blowing in
the spring !

The stooping boughs above me,
The wandering bee to love me,
The fern and moss to keep across,
And the Elm-tree for our King !

Nay—stay ! I wish I were an Elm-tree,
A great lofty Elm-tree, with green leaves gay !
The winds would set them dancing,
The sun and moonshine glancing,
The Birds would house among the boughs,
And sweetly sing !

O—no ! I wish I were a Robin,
A Robin or a little Wren, everywhere to go ;
Through forest, field, or garden,
And ask no leave or pardon,
Till Winter comes with icy thumbs
To ruffle up our wing.

Well—tell ! Where should I fly to ?
Where go to sleep in the dark wood or dell ?
Before a day was over,
Home comes the rover,
For Mother's kiss, sweeter this
Than any other thing !

LITTLE THINGS

The writer of these children's verses was not known as a poet, but as a compiler of books of reference for students. His name was Ebenezer Cobham Brewer, and he died in 1897 aged eighty-seven. "Little Things" has long been a favorite.

LITTLE drops of water,
Little grains of sand,
Make the mighty ocean
And the pleasant land.

Thus the little minutes,
Humble though they be,
Make the mighty ages
Of eternity.

Thus our little errors
Lead the soul away
From the path of virtue,
Far in sin to stray.

Little deeds of kindness,
Little words of love,
Make our earth an Eden,
Like the heaven above.

Little seeds of mercy,
Sown by youthful hands,
Grow to bless the nations
Far in heathen lands.

THE BLIND BOY

Colley Cibber was a famous actor and writer of comedies who lived from 1671 to 1757. He was also Poet Laureate. These pathetic verses, which have been long familiar in the children's books of several generations, were written by him.

O, say, what is that thing call'd light,
Which I must ne'er enjoy ;
What are the blessings of the sight ?
O, tell your poor blind boy !

You talk of wondrous things you see,
You say the sun shines bright ;
I feel him warm, but how can he
Or make it day or night ?

My day or night myself I make
Whene'er I sleep or play ;
And could I ever keep awake
With me 'twere always day.

With heavy sighs I often hear
You mourn my hapless woe ;
But sure with patience I can bear
A loss I ne'er can know.

Then let not what I cannot have
My cheer of mind destroy ;
Whilst thus I sing, I am a king,
Although a poor blind boy.

THE SHEPHERD'S COT

William Shenstone, the author of this artless little poem of rural life, was born in 1714 and died in 1763. He was a pleasant writer, but is not among the notable poets of England.

MY banks they are furnished with bees,
Whose murmur invites one to sleep,
My grottoes are shaded with trees,
And my hills are white over with sheep.
I seldom have met with a loss,
Such health do my fountains bestow ;
My fountains all bordered with moss,
Where the harebells and violets blow.

Not a pine in the grove is there seen,
But with tendrils of woodbine is bound ;
Not a beech's more beautiful green,
But a sweetbriar entwines it around.
Not my fields in the prime of the year,
More charms than my cattle unfold ;
Not a brook that is limpid and clear,
But it glitters with fishes of gold.

I have found out a gift for my fair,
I have found where the wood-pigeons
breed ;
But let me such plunder forbear,
She will say 'twas a barbarous deed ;
For he ne'er could be true, she averred,
Who would rob a poor bird of its young ;
And I loved her the more when I heard
Such tenderness fall from her tongue.

THE BUTTERFLY'S BALL

William Roscoe, who died in 1831, was a writer of historical works; but he could also write lively and fanciful poetry, as we may see from this delightful piece of fancy, which is certainly among the best of all the poetry written by him.

COME, take up your hats, and away let us haste

To the Butterfly's ball and the Grasshopper's feast;

The trumpeter Gadfly has summon'd the crew,
And the revels are now only waiting for you.

On the smooth shaven grass by the side of the wood,

Beneath a broad oak that for ages has stood,
See the children of earth, and the tenants of air,

For an evening's amusement together repair

And there came the Beetle, so blind and so black,

Who carried the Emmet, his friend, on his back;

And there was the Gnat, and the Dragon-fly too,

With all their relations, green, orange and blue.

And there came the Moth in his plumage of down,

And the Hornet in jacket of yellow and brown,
Who with him the Wasp his companion did bring,

But they promised that evening to lay by their sting.

And the sly little Dormouse crept out of his hole,

And led to the feast his blind brother the Mole;

And the Snail, with his horns peeping out from his shell,

Came from a great distance—the length of an ell.

A mushroom their table, and on it was laid

A water dock leaf, which a table-cloth made;

The viands were various, to each of their taste,

And the Bee brought his honey to crown the repast.

There close on his haunches, so solemn and wise,

The Frog from a corner look'd up to the skies;

And the Squirrel, well pleased such diversion to see,

Sat cracking his nuts overhead in a tree.

Then out came the Spider, with fingers so fine,

To show his dexterity on the tight line:

From one branch to another his cobwebs he slung,

Then as quick as an arrow he darted along.

But just in the middle, oh! shocking to tell!

From his rope in an instant poor Harlequin fell;

Yet he touch'd not the ground, but with talons outspread,

Hung suspended in air at the end of a thread.

Then the Grasshopper came with a jerk and a spring,

Very long was his leg, though but short was his wing;

He took but three leaps, and was soon out of sight,

Then chirp'd his own praises the rest of the night.

With step so majestic the Snail did advance,

And promised the gazers a minuet to dance;

But they all laugh'd so loud that he pull'd in his head,

And went in his own little chamber to bed.

Then as evening gave way to the shadows of night,

The watchman, the Glow-worm, came out with his light;

Then home let us hasten while yet we can see,
For no watchman is waiting for you and for me.

THE SLAVE'S DREAM

In the old days of slavery in America, negroes were captured in Africa and taken away in ships to serve on the American plantations. No respect was paid to persons; chiefs and tribesmen, women and children, were forced into slavery. Longfellow, the American poet, here imagines one who had been a negro king and is now a worn-out slave in the south dreaming he is once more back in his native land; but his dream is the last he will ever have, for he will never wake again.

BESIDE the ungathered rice he lay,
His sickle in his hand;

His breast was bare, his matted hair
Was buried in the sand.

Again in the mist and shadow of sleep,
He saw his native land.

Wide through the landscape of his dreams
The lordly Niger flowed,

Beneath the palm-trees on the plain
Once more a king he strode;

And heard the tinkling caravans
Descend the mountain-road.

He saw once more his dark-eyed queen
Among her children stand;

They clasped his neck, they kissed his cheeks,
They held him by the hand!—

A tear burst from the sleeper's lids
And fell into the sand.

And then at furious speed he rode
Along the Niger's bank;

His bridle-reins were golden chains,
And, with a martial clank,

At each leap he could feel his scabbard of steel
Smiting his stallion's flank.

Before him like a blood-red flag,
The bright flamingoes flew;

From morn till night he followed their flight,
O'er plains where the tamarind grew,

Till he saw the roofs of Caffre huts,
And the ocean rose to view.

At night he heard the lion roar,
And the hyena scream,

And the river-horse as he crushed the reeds
Beside some hidden stream;

And it passed, like the glorious roll of drums,
Through the triumph of his dream.

The forests, with their myriad tongues,
Shouted of liberty;
And the Blast of the Desert cried aloud,
With a voice so wild and free,
That he started in his sleep and smiled
At their tempestuous glee.

He did not feel the driver's whip,
Nor the burning heat of day;
For Death had illumined the Land of Sleep,
And his lifeless body lay
A worn-out fetter, that the soul
Had broken and thrown away!

MINNIE AND WINNIE

As we have often seen, the great poet who writes of the most serious things can also write with charm and delight about the littlest child-like fancies. This Lord Tennyson proves in these quaint little verses to Minnie and Winnie. They are as sweet and delicate as the pretty pink-lined shell itself.

MINNIE and Winnie
Slept in a shell.
Sleep, little ladies!
And they slept well.

Pink was the shell within,
Silver without;
Sounds of the great sea
Wander'd about.

Sleep, little ladies!
Wake not soon!
Echo on echo
Dies to the moon.

Two bright stars
Peep'd into the shell.
"What are they dreaming of?
Who can tell?"

Started a green linnet
Out of the croft;
Wake, little ladies,
The sun is aloft!

GOOD-NIGHT, GOOD-NIGHT!

Joanna Baillie was one of the most popular women writers in the first half of the nineteenth century. Her poetry was read throughout the length and breadth of the English-speaking world, and several of her plays were performed with success. These beautiful lines are taken from one of her poems.

THE sun is down, and time gone by,
The stars are twinkling in the sky,
Nor torch nor taper longer may
Eke out a blithe but stunted day;
The hours have passed with stealthy flight,
We needs must part: good-night, good-night!

The lady in her curtained bed,
The herdsman in his wattled shed,
The clansman in the heathered hall,
Sweet sleep be with you, one and all!
We part in hopes of days as bright
As this gone by: good-night, good-night!

Sweet sleep be with us, one and all!
And if upon its stillness fall
The visions of a busy brain,
We'll have our pleasures o'er again,
To warm the heart, to charm the sight,
Gay dreams to all! good-night, good-night!

* From "Poems and Ballads" copyright, 1895, 1896, by Charles Scribner's Sons.

THE LAND OF NOD*

As we are already acquainted with Robert Louis Stevenson's beautiful little poems, we might almost guess that this "Land of Nod" had been written by him, its manner is so peculiar to that charming poet. The "land" is, of course, none other than the strange country we often visit in our dreams.

FROM breakfast on through all the day
At home among my friends I stay;
But every night I go abroad,
Afar into the land of Nod.

All by myself I have to go,
With none to tell me what to do—
All alone beside the streams,
And up the mountain-sides of dreams.

The strangest things are there for me,
Both things to eat and things to see,
And many frightening sights abroad
Till morning in the land of Nod.

Try as I like to find the way,
I never can get back by day,
Nor can remember plain and clear
The curious music that I hear.

HOHENLINDEN

One of the most famous battle poems, this was written by Thomas Campbell soon after the great battle which was fought in the year 1800. "Furious Frank and Fiery Hun" refers to the opposing forces. The French, or Franks, led by a great general, named Moreau, routed the Austrians, who, for poetical purposes, may be regarded as descendants of the old Huns, the warriors that once overran most of Europe.

ON Linden, when the sun was low,
All bloodless lay the untrodden snow;
And dark as winter was the flow
Of Iser, rolling rapidly.

But Linden show'd another sight,
When the drum beat at dead of night,
Commanding fires of death to light
The darkness of her scenery.

By torch and trumpet fast arrayed,
Each horseman drew his battle-blade,
And furious every charger neigh'd
To join the dreadful revelry.

Then shook the hills, with thunder riven;
Then rushed the steed, to battle driven;
And, louder than the bolts of heaven,
Far flashed the red artillery.

But redder yet that light shall glow,
On Linden's hills of stained snow;
And bloodier yet the torrent flow
Of Iser, rolling rapidly.

'Tis morn; but scarce yon level sun
Can pierce the war-clouds, rolling dun,
Where furious Frank and fiery Hun
Shout in their sulphurous canopy.

The combat deepens. On, ye brave,
Who rush to glory, or the grave!
Wave, Munich, all thy banners wave!
And charge with all thy chivalry!

Few, few shall part, where many meet!
The snow shall be their winding-sheet,
And every turf beneath their feet
Shall be a soldier's sepulchre!

LITTLE VERSES FOR VERY LITTLE PEOPLE

DANCE to your daddie,
My bonnie laddie,
Dance to your daddie, my bonnie lamb !
You shall get a fishie,
On a little dishie,
You shall get a herring when
the boat comes hame !



Dance to your daddie,
My bonnie laddie,
Dance to your daddie, and to
your mammie sing !
You shall get a coatie,
And a pair of breebies,
You shall get a coatie when the boat
comes in !

GIRLS and boys come out to play,
The moon doth shine as bright as
day ;

Leave your supper, and leave your
sleep,
And come with your playfellows into
the street.

Come with a whoop, come with a call,
Come with a goodwill or not at all.
Up the ladder and down the wall,
A halfpenny roll will serve us all.
You find milk, and I'll find flour,
And we'll have a pudding in half-an-
hour.

PAT-A-CAKE, pat-a-cake, baker's man !
So I will, master, as fast as I can :
Pat it and prick it and mark it
with T,
Put in the oven for Tommy and me.

TAFFY was a Welshman, Taffy was a
thief,
Taffy came to my house, and stole a
piece of beef ;
I went to Taffy's house, Taffy was not
at home ;
Taffy came to my house, and stole a
marrow-bone ;
I went to Taffy's house, Taffy was not
in ;
Taffy came to my house, and stole a
silver pin ;
I went to Taffy's house, Taffy was in
bed ;
I took up a poker and flung it at his
head.

SEA-GULL, sea-gull, sit on the sand,
It's never good weather when you're
on the land.

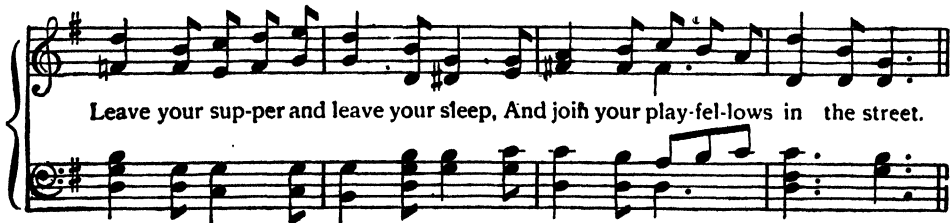
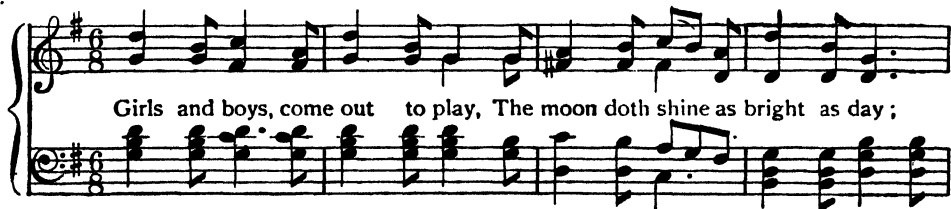


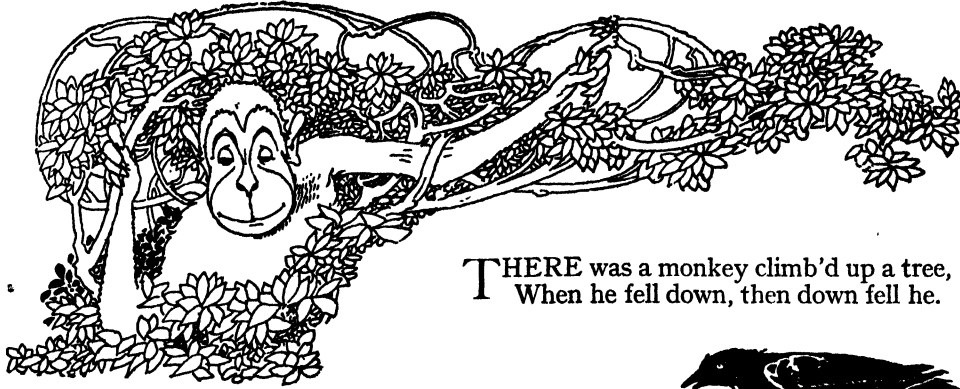
AS I walked by myself,
And talked to myself,
Myself said unto me :
Look to thyself,
Take care of thyself,
For nobody cares for thee.

I answer'd myself,
And said to myself,
In the self-same repartee,
Look to thyself,
Or not look to thyself,
The self-same thing will be.

HIGGLEDY Piggledy, here we lie,
Picked and plucked, and put in a
pie !

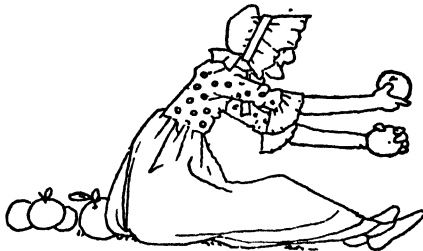
GIRLS AND BOYS COME OUT TO PLAY



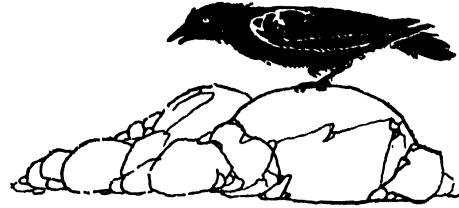
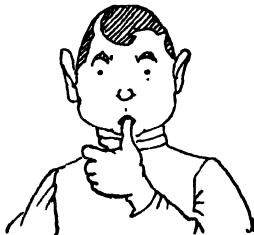


THERE was a monkey climb'd up a tree,
When he fell down, then down fell he.

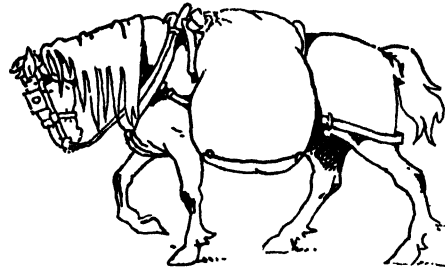
There was an old woman who ate an
apple,
When she ate two, she ate a couple.



There was a butcher
who cut his thumb,
When it did bleed,
then blood did
come.



There was a crow sat on a stone,
When he was gone, then there was none.



There was a horse going to a mill,
When he went on, he stood not still.

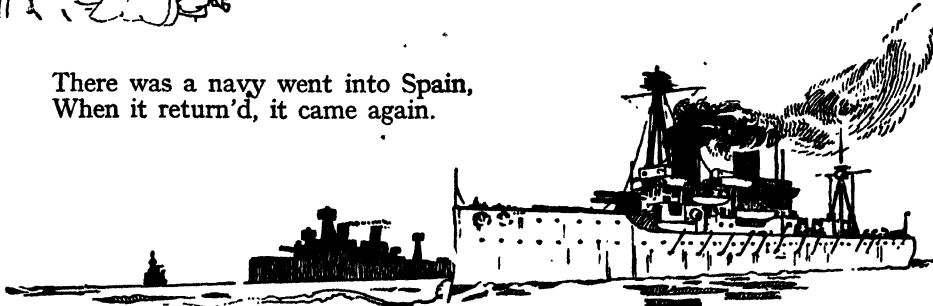


There was a cobbler
clouting shoon,
When they were
mended, they were
done.

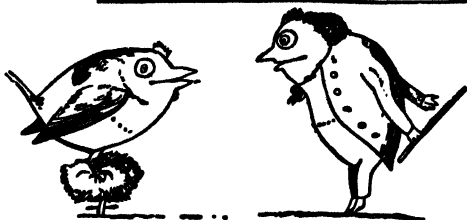


There was a jockey ran a race,
When he ran fast, he ran apace.

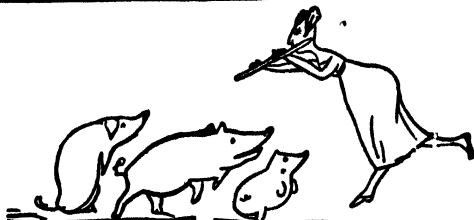
There was a navy went into Spain,
When it return'd, it came again.



THE NONSENSE OF EDWARD LEAR



THERE was an old man who said, "Hush!
I perceive a young bird in this bush!"
When they said, "Is it small?"
He replied, "Not at all!
It is four times as big as the bush!"



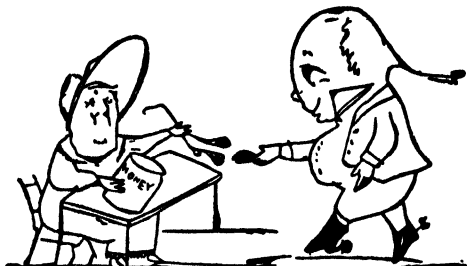
THERE was a young lady of Bute,
Who played on a silver-gilt flute;
She played several jigs
To her uncle's white pigs,
That amusing young lady of Bute.



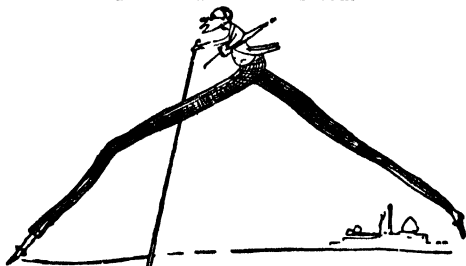
THERE was an old person of Mold,
Who shrank from sensations of cold;
So he purchased some muffs,
Some furs, and some fluffs,
And wrapped himself from the cold.



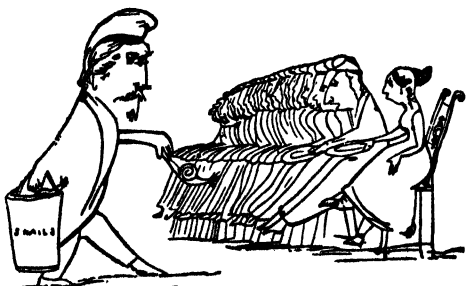
THERE was an old man of Corfu,
Who never knew what he should do;
So he rushed up and down,
Till the sun made him brown,
That bewildered old man of Corfu.



THERE was an old man of Kilkenny,
Who never had more than a penny;
He spent all that money
In onions and honey,
That wayward old man of Kilkenny.



THERE was an old man of Coblenz,
The length of whose legs was immense;
He went with one prance
From Turkey to France,
That surprising old man of Coblenz.



THERE was an old person of Sparta,
Who had twenty-five sons and one
daughter;
He fed them on snails,
And weighed them in scales,
That wonderful person of Sparta.



THERE was an old person of Dutton,
Whose head was as small as a button;
So to make it look big
He purchased a wig,
And rapidly rushed about Dutton.

The Book of GOLDEN DEEDS



THE MAN WHO SAVED ST. HELIER

THE people in the Isle of Jersey were celebrating the anniversary of the Coronation of King George on June 4th, 1804. Everybody was rejoicing, and all the morning Royal salutes had been fired from the big guns in the forts. One of these was the New Fort, which stood above St. Helier, the town shown in the picture.

The guns were fired by means of long pieces of stick dipped in brimstone, and looking something like giant matches. When the saluting was over, the unused "matches" were taken back to the great magazine, where hundreds of barrels of gunpowder were stored. The firing-party then locked up the magazine, and the keys were taken away by Captain Salmon, the artillery officer.

Nothing more was thought about it till the evening, when the sentries, going their rounds, noticed smoke coming out under the door. They at once ran to give the alarm, shouting "Fire!" The signal officer, whose name was Lys, ran down from his station at the watch-house on the hill, and found that smoke was pouring from both ends of the powder magazine.

Two carpenters, named Edward and Thomas Touzel, were with the signal officer, and Thomas was asked to carry the news at once to the Commander-in-Chief, and to bring back the keys of the magazine as quickly as possible.

As he was starting, he urged his brother Edward to go with him, or at least to keep out of danger ;

CONTINUED FROM 982



but Edward replied : " We have all got to die some day, and I mean to save the magazine if I can."

He then called to some soldiers to lend a hand, and one of them, named Ponteney, answered : " I am ready to take the risk."

Touzel then seized a strong iron bar, wrenched open the iron railings fixed round the magazine, and after great efforts succeeded in forcing open the door of the building, from which dense clouds of smoke at once rolled. Great piles of the sulphur matches and many of the ammunition cases had caught fire, and the flames were already curling round the great barrels in which the gunpowder was stored. It seemed that every moment a tremendous explosion must take place, and everyone standing near would probably be blown to pieces.

But Edward Touzel, though he fully realized the danger, was not the man to draw back. Rushing in, he caught up great armfuls of the burning matches and threw them to Lys and Ponteney, who in their turn threw them farther away from the entrance.

Touzel did this till the skin of his face and hands was all burnt, and he was almost choked by the dense smoke. By this time soldiers were running from all directions bringing pails of water, and the fire was at last conquered.

If Touzel had waited until the keys came from the governor's house, the magazine would have blown up. 1063

THE WOLF THAT CAME IN THE NIGHT

NEARLY a hundred years ago a French lawyer, named the Baron de Monthyon, left a large sum of money to provide an annual prize for "the poor French person who in the course of the year shall have performed the most virtuous actions."

The records of this annual award are a wonderful roll of golden deeds; but it is doubtful whether they contain a more heroic story than that of Madeleine Saunier, a poor young woman whose whole soul was fixed on doing deeds of charity, and who contrived to help others in a marvelous way.

A poor blind widow, with a feeble daughter, lived a mile and a half from her cottage, and for fifteen years Madeleine never failed to walk daily to them, to feed them, set their house in order, and cheer them up to wait for her coming the next day.

About as far off in another direction there lay in an outhouse a poor girl smitten with leprosy, and deserted by her friends. For eighteen months Madeleine visited her twice a day, to give her the little food she could take, and to dress her frightful wounds, until at last the poor leper died in her arms.

In 1840 Madeleine was nearly drowned in trying to cross a swollen stream that lay between her and one of her daily pensioners, and when she was blamed for her rashness she only said:

"I could not help it; I could not go yesterday, so I had to go to-day."

THE QUAKER'S STROKE

YOU must understand that Quakers are good people who believe that fighting is wicked, and therefore they refuse to become soldiers or sailors.

Well, once upon a time there was a Quaker on board an American trading vessel, when a French ship came up and gave them battle. Everyone on board the trading vessel except the Quaker fought desperately for their lives. The Quaker, with his hands clasped behind his back, walked calmly and quietly up and down the deck, in the midst of the bullets.

Then the vessels came to close quarters, and the French cried out that they would board the American ship. The Quaker continued his walk. The sides

One cold winter she had a terrible experience. She was nursing a dying woman named Mancel, who lived on the hillside in a hovel more like a wild beast's den than the home of a human creature. Towards the end of a long night, Madeleine had lighted a few green sticks to try and lessen the intense cold, when the wretched door, which was only closed by a stone on the floor, was pushed aside, and she saw a wolf about to leap into the room.

She sprang to the door, and held it fast, pulling up everything she could to keep it shut, as the beast sprang against it; while she shouted as loudly as she could, in the hope that the wolf might be frightened away. But all the rest of that terrible night she had to hold the door against the wolf.

Not long afterwards the sick woman died, and Madeleine feared lest the wolf should come again. So she went to the nearest cottage, and begged for shelter for the corpse until the burial. The cottagers consented, and back went Madeleine across the snow, through the lonely, wolf-haunted waste to the hut on the hillside. She took the body on her shoulders, and, bending under her burden, she brought it to the cottage, where she fell on her knees and thanked God for her safety. The next day the wolf's footsteps in the snow showed that he had been prowling round the hut during the night, and the broken-down door showed that he had found an entrance.

of the ships bumped and grunted together. There was a loud shout of triumph from the French. The Americans loaded their guns and stood ready to sell their lives dearly. Then a Frenchman rushed forward to lead the attack.

Just as he reached the American ship, and before anybody quite knew what had happened, the Quaker suddenly slipped up to him, put his arms about the Frenchman's body, and said very quietly and reprovingly, "Friend, thou hast no business here." And with that he lifted up the Frenchman, and, as though he were handing a baby to its nurse, dropped him gently but surely over the ship's side.

THE TALLOW DIP AND THE BLACK SALT

RATHER more than two hundred years ago, Lady Edgeworth, the beautiful young wife of Sir John Edgeworth, lived with her husband at a place in Ireland called Castle Lissard. In those days there were no trains and the roads were bad, so that little traveling was done and many people lived in the country all the year round. The men would hunt and shoot and fish, or if they were good landlords, look after their tenants, while the women of the family prided themselves upon their preserves and linen cupboards and the general comfort of the house.

There was much disturbance in Ireland at this time and very little law and order. The highways were infested with lawless men, and people who lived far from the cities often had their houses attacked, their goods stolen and they themselves were sometimes injured. This was the usual order of things, however, and people were so accustomed to it, that men and women alike were trained to act with coolness in time of need. One Christmas time, it happened that Sir John and Lady Edgeworth were entertaining guests although they knew that their house might be attacked by a party of highwaymen who were holding that part of the country in terror. In readiness for their coming a barrel of gunpowder was always kept in a loft, and the guns stacked ready for use.

One evening the alarm came. The men rapidly got their guns, and while they hurried to secure window shutters and slip heavy bolts on the doors and post sentries at various points, Lady Edgeworth went up to the loft to bring down some powder. In those days there were no cartridges, but you had to drop the powder into the barrel of the musket and ram the bullet down with a ramrod.

As she hurried up the dark old staircase she saw a stooping form in one of the corners and recognized Biddy, the new little maid-servant who had but recently arrived from the city and was frightened out of her senses by the thought of robbers.

Lady Edgeworth pretended not to notice her alarm.

"Come, Biddy," she called, "carry this light for me." And the little maid ran to her with relief and took the light,

which was nothing better than a spluttering tallow candle, without a candlestick, as was common enough at that time. Together the two women mounted the shallow stairs to the gallery which ran around the main hall, and then Lady Edgeworth opened one of the many doors which gave off from the gallery. A steep flight of wooden stairs leading up into gloom and cobwebs appeared, and a curious smell floated out upon the air. The young girl shivered and hung back, but her mistress merely laughed at her tremors, and taking the candle, led the way up to the loft.

Biddy knew nothing about gunpowder, and Lady Edgeworth did not explain what she was in search of for she knew that it would only increase the girl's terror. Yet when she had got half-way down the stairs again she looked back and saw Biddy behind her with no candle.

"Biddy," said Lady Edgeworth, with a curious sinking feeling, though she spoke quite calmly, "where's the candle?"

"Sure, and I left it," says Biddy, "sticking in the barrel of black salt. I'll go fetch it!"

Now, even the kind of wax candle that we use would have been dangerous enough, but the old tallow candles shed sparks much more easily. If a spark from that candle reached the "black salt," there would be a fearful explosion; half the house would be blown down, and many lives lost. As quick as a flash Lady Edgeworth decided what to do. She turned and bade the wondering little maid go quickly down, then darted upstairs again to where the candle stood spluttering and flaring on top of the barrel of gunpowder. There was not a second to lose and the brave young wife did not hesitate: she lifted the candle with firm fingers and, shading it with her hand, carried it calmly out of the room. Neither she nor any one else got hurt, so her golden deed was by no means in vain. The heroine herself lived to be ninety years old and was the ancestress of Maria Edgeworth, whose books on Irish life and manners suggested to Sir Walter Scott his pictures of Scotland, and to Turgeneff his studies of the Russian peasant.

THE NEXT GOLDEN DEEDS ARE ON PAGE 1187.

ANIMALS LIVING ON LAND AND SEA



This is a sea-lion, one of the great family of seals. The walrus shown here is a monstrous animal, 12 to 15 feet in length and very heavy, and waddles with difficulty on land. Its great tusks are used for the purpose of digging up the shell-fish on which it lives. It fights bravely to save the lives of its young ones.



The small picture shows us a common seal. The larger animal is the sea-elephant, which is larger than the land elephant. It measures from 20 to 30 feet in length and from 15 to 18 feet round. Its snout is lengthened into a sort of trunk. The body of a full-grown sea-elephant contains about 70 gallons of pure oil.

The Book of NATURE

WHAT THIS STORY TELLS US

THE age of giant animals is not quite passed away. There are giants still in the sea, so big that the biggest animals on land would seem small beside them. They could not get food enough on land, so they have changed from land animals into sea animals. There, in the vast deep, great whales live their lives amid friends and terrible enemies; and whales are not the only animals which left the land for the ocean. The great waters hide many curious creatures—some of them the animals which men call mermaids. Seals of many sorts pass the greater part of their lives in the sea, but they come to land for a certain time each year. Then they go back, having first taught their babies, which are always born on land, how to swim and hunt for their food in the deep. Here we read of these monsters, and see how, by improving their brains, they live on, while others like them, but without their brain-power, perished millions of years ago.

ANIMALS LIVING IN THE SEA

IN reading these stories about Nature's great family of animals, perhaps you may feel a little vexed to think that this is the day of small things—the day of smaller lions, and tigers, and reptiles; of smaller birds and other creatures than once lived upon the earth. Well, there still live creatures as big as any that the world has known. Not even in the old days, when many creatures were monsters in size, was there a bigger animal than the whale which swims the seas to-day.

"But whales are fishes," you will say. Nearly everybody thinks that. They think that whales and dolphins, and porpoises and manatees and dugongs, are fishes, like the shark and the fishes that we eat. Scientists also thought so many years ago. But these creatures which we have been mentioning are animals. They are mammals, which, as you know, are creatures that feed their young on milk. The whale is a mammal, like a bat or an elephant.

* As whales live in the sea, you would not think that they could be drowned; but they can. They, like ourselves, have to breathe the air of the atmosphere to live. To do so they have to come to the surface of the water. You know the cry of the whalers—the men who hunt the whale. "There she blows," they cry when they see a monster rise to the surface and spout streams and vapor

CONTINUED FROM P. 1018



into the air. Well, when the whale comes up to spout, it means that he has been down under water as long as he can, and has been driven to the surface to breathe out the air which has been used up in his

body, and to take in a fresh supply.

Now, as he must remain below at great depths for a long time, the whale has a specially developed system of vessels in which it stores up blood purified by the air which it has taken in. This reserve of oxygen it uses up slowly while it is below the water; and by this wonderful provision it can remain in the depths for a very long time.

Clever men were for a long time puzzled to know why the whale has a monstrous flat tail. Most fishes have tails which are upright. The whale's tail is flat. The whale would not be perfect without a flat tail. As it is so huge an animal, much strength is required to drive it through the waters, and still more to raise it from a great depth to the top of the water. Fishes have gills with which they breathe the oxygen actually in the water. Whales must breathe in the open air itself. The fishes are quite well served by their upright tails, which steer them through the waters when they are swimming horizontally or flat in the water. But the whale wants suddenly to bound up from the depths of the ocean to the top of the waves. His immense flat tail, which measures about 18 feet across, is the

lever which lifts him. With two or three movements of this tail he drives himself up to the top of the sea, to breathe and blow and spout to his heart's content. This is why the shape of the whale is different from that of most fish.

A WHALE THAT WAS BURIED FOR THOUSANDS OF YEARS

Once upon a time, ages and ages ago, whales were probably like frogs, in the sense that they could live either on the land or in the water. They were, most likely, great hairy animals with four legs. Some of them were armored like the crocodile. The remains of whales of other ages are so numerous, buried in the earth in parts of America, that farmers dig up their bones and use them as fences. Eighty years ago the remains of a whale were found embedded in a cliff on the south coast of England. A storm had washed away part of the cliff, and fishermen found a bone 9 feet long sticking out of the cliff. When the remains were examined they were found to be those of a whale over 70 feet long, which had died thousands of years ago.

Not all the whales have teeth—the whalebone whales have not. But the baby whales all have teeth, showing that long ago all whales had these weapons. The main difference between whales to-day is in the matter of teeth. That difference is important, because it decides what food the whale shall eat. One sort of toothed whale, the grampus, has such good teeth that it has become a cannibal. Not content with cuttle-fish, huge jelly-fish, and seals, it eats other whales. The toothed whales include the sperm whale, the bottle-nose whale, and lesser sorts. The whale without teeth, called the baleen whale—that is, the whale which has whalebone—is the most valuable of all whales. This one gives not only oil, like the toothed whales, but whalebone, which is worth over \$10,000 a ton.

A WHALE'S MOUTH IN WHICH A BOAT AND ITS CREW COULD FLOAT

Let us try to picture a baleen whale. An average large one is from 60 to 70 feet in length, and from 30 to 40 feet round the thickest part. The head is about 20 to 25 feet long. Right on top of the head are the two nostrils, placed there so that the whale can

breathe the moment it comes to the surface. The nostrils can be closed and shut fast by valves, which keep the water from entering the nose and reaching the lungs. On its back the whale is of a dark color, so that, with the light shining down through the water, the back of the whale looks like the water itself. Underneath the whale is light in color.

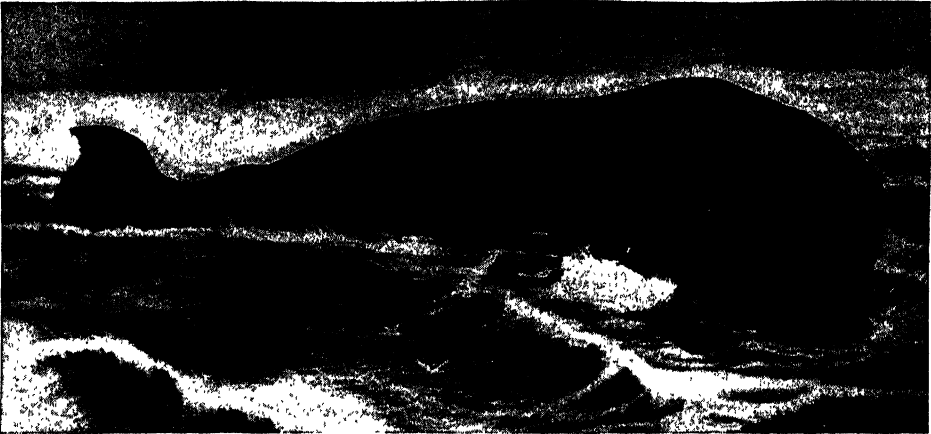
The mouth of the whale is the biggest mouth in the world. When the jaws open it looks as if the huge head had split in two. The length of the jaw is about 16 feet; it is 7 feet across, and, when open, the space between the lower jaw and the roof of the mouth is a good 12 feet. Thus a ship's boat with the crew in it could go comfortably into the open mouth of a whale. But this great cavern is more like a jungle than a cave. This whale has not a tooth in its head. The lower jaws are smooth and polished, but from the upper jaw hangs the famous baleen, or whalebone.

THE WHALEBONE IS THE WHALE'S GREAT FISHING-NET

The whalebone which you see is not cut from out the body of the whale; it is the network of plates hanging down from the roof of the mouth. A cow has hard, broad ridges on the roof of its mouth. So has the whale, only here they are greatly enlarged. The plates are thick and solid where they grow out of the roof of the mouth, but they taper away, and at the ends appear like hair. That is really what they are—plates of hair hardened into a sort of horn, fringed at the end. Of these plates there are from 200 to 400 on each side of the upper jaw, and their weight, in a big whale, is a ton and a half.

What is the purpose of this great mass of whalebone in the monster's mouth? The mouth of the baleen whale is his vast fishing-net. Although he is the biggest creature in the sea, this whale eats the smallest creatures, chiefly little jelly-fish. He has to catch these in shoals to satisfy his appetite, otherwise he would starve. So he swims into a great shoal of the things which form his food. How does he find them? He can see, and probably he can smell. When he reaches a shoal of eatable things, he charges right through it, with his mighty mouth open. The tiny jelly-

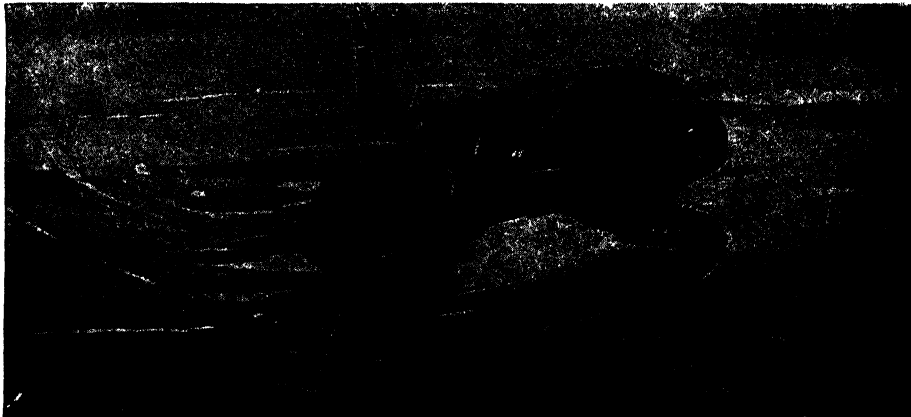
GIANT MONSTERS OF THE SEA



The biggest creatures in the world are whales. Although they live in the sea they are not fishes, but animals. They feed their young on milk ; they cannot breathe under water. This is a baleen whale, which has no teeth. Its enormous mouth is fitted with whalebone, with which it catches its food, as in a fishing-net. The whalebone in a whale's mouth may weigh $1\frac{1}{2}$ tons, and is worth \$10,000 a ton. The whale's oil is valuable.



This is a cachalot, or sperm-whale. It has about fifty teeth in the lower jaw, but none in the upper. At the back of its head are stored tons of oil, from which we get spermaceti for ointments and the best candles. We get ambergris from the cachalot, which is made into perfume worth from \$10 to \$30 an ounce. The male cachalot is about 75 feet long, and fights fiercely with other cachalots when the herds are being formed.



The great whales do not eat each other, but here is a cannibal whale. It is the grampus, or killer. Several grampuses join together to kill the other whale. The grampus is 20 feet long, and has terrible teeth.

fish are taken in crowds into his mouth. The great jaws close like a drawbridge. The whalebone folds back towards the throat. In the forest of horn and hair are the fish and other things which he has caught. As the whalebone sinks back, these drop down to the whale's tongue, and the water squirts out at the sides of the mouth. Then the whale swallows his "catch."

TINY FOOD FOR THE LARGEST MOUTH IN THE WORLD

The reason for all this is that the whale must have tiny things to eat, because his throat is so small. Big men could stand upright in the mouth of the whale, but the throat of the beast is so small that it could hardly admit a man's fist; while the tube down which the food passes to the stomach is only about as thick as an ordinary walking-stick. The throat is fitted with muscles which cause it to close up like a spring trap once the food has been admitted. So much for the mouth.

But the body itself is peculiar and wonderful. Over all is the thick oily skin. It is oily so that the friction of the waves may be lessened. Underneath there is a second skin, which gives the whale its color. Still lower there is a third covering, the blubber oil and solid fat. It forms a great blanket round the whale, in places 2 feet thick. This blubber weighs quite 30 tons, as much as the weight of nearly 500 men.

HOW IT IS THAT THE WHALE IS THE FINEST OF ALL DIVERS

The oil and blubber serve a double purpose. In the first place, they keep the whale warm—for the blood of the whale, remember, is warm like ours. Next, they act as a protection against the force of the waves. Our best men divers cannot go down more than a few score feet, and the finest ships made for descending into the depths of the sea go only a comparatively little way, because the pressure of the water is so enormous. But a whale, after having taken a breath, will plunge a mile deep, and at that depth the weight which it has to bear upon its whole body is some 211,200 tons, or over 137 tons on every square foot of its body. Nothing else can bear such a pressure. Some fish which live low down in the water burst

when brought to the surface of the water, because the pressure necessary to keep them whole is removed. Other fish, if forced deep down into the water, would be crushed by the weight of water which they would there have to support. But here we see that the whale, thanks largely to its blanket of springy blubber, can bear the pressure of the deep sea, and then come to the top and not be hurt when the pressure is removed.

Men hunt the baleen whale for its whalebone and blubber. The blubber makes oil. The whalebone makes a variety of things. There is nothing else so good for the purposes which it serves. The whale swims from the frozen seas of the north to the warm seas to the south of our country; so the whalebone, when removed from its mouth, will stand all sorts of climates. The best whale of this type is the Right whale, called also the Greenland whale, or the bowhead whale. One of these has been known to yield 1½ tons of whalebone, as well as 275 huge barrels of oil.

A MAN WHO WAS NEARLY SUFFOCATED BY SINKING INTO A WHALE'S TONGUE

Many years ago a whale was exhibited in England, dead, of course, which was bigger than these of which we have been talking. It was 132 feet long, and weighed 200 tons. Its head was 20 feet long, and 152 children stood at one time in its open jaws. Another one, shown in London, weighed 240 tons. Its head was 22 feet long, its backbone 70 feet long; its tail was 22½ feet broad and 3 feet long. Its flesh weighed 85 tons, its skeleton weighed 35 tons; and 4000 gallons of oil were extracted from the blubber. In the upper jaws were 800 plates of whalebone. The age of this whale was thought by great men to be nearly 1000 years.

Once a whale was caught in the Thames, and a man went some days afterwards to inspect it. The mouth was propped open with poles, so, wishing to see what it was like inside, the man stepped in and walked upon the whale's tongue. The weather had made the tongue soft, and the poor man sank down and down in it, until he was almost buried. Other men pushed a pole towards him, and, clinging to this, he was



Very often, when grampuses attack a big whale, the sword-fish helps them. This is a sword-fish, a fearful creature, which with its sword can penetrate the timbers of a great ship, which it mistakes for a whale.

pulled out of the whale's tongue. But for this help he would have been buried in the mass. This gives us an idea of the immense size of the whale.

Now we come to the toothed whales. Of these the largest is the cachalot. This has no teeth in the upper jaw, but those in the lower jaw number from forty to fifty, and weigh from two to four pounds each. The jaws are enormous, for the head is nearly a third of the whole length of the body, which, in the large one, measures from 70 to 80 feet. These figures describe the male whales, for the females are smaller. The cachalot is called the sperm-whale. The reason for this is the substance stored

in a great chamber of the head. This chamber lies behind the nostrils, from which it is divided by a thick wall of bone, semicircular in shape and several feet high. When a sperm-whale is caught the head is cut open, and men lower buckets into the opening and take out the oil in it. This oil, when refined, gives spermaceti, from which the finest candles and many ointments are made. From one cachalot, which measured only 64 feet, there were obtained 24 barrels of spermaceti and nearly 100 barrels of oil, from which the spermaceti had been refined. Another strange product of the sperm-whale is ambergris. It is a speckled grey, fatty



This is a saw-fish, which also helps the grampus in its attacks upon the big whales. Measuring 12 feet in length, it makes a fierce rush and plunges its weapon into the soft part of its victim, then saws open a great wound, which is bound to cause death. The saw-fish has poor teeth, and can eat only soft food.

substance, into which the whale changes part of its food. Some think it a sign of disease. Ambergris used to be found floating on the sea, and men thought it was a kind of amber, and called it ambergris for that reason. But now we know that it is produced by the sperm-whale, in whose body as much as 50 pounds at a time have been discovered. Formerly ambergris was used for medicine, but now it is used only for scent. Even when it is plentiful, manufacturers pay \$10 an ounce for ambergris, but when it is scarce they are glad to get it at \$30 an ounce. A whale with 50 pounds of ambergris would be worth from \$8000 to \$25,000 for this alone, to say nothing of the value of its oil and spermaceti.

THE GREAT SEA-FIGHTS OF THE GREAT TOOTHED WHALES

The value of the whales for whale-bone and ambergris, oil and spermaceti, causes them to be cruelly hunted by men, and in some seas where whales used to be plentiful hardly any are now to be found. Luckily, the seas are wide and deep, and there will always be some place to which the whales may go where men cannot find them. But they have other enemies as well as men. The sperm-whales fight fiercely among themselves. The males battle with other males, and kill each other. Great toothed whales have been found dead with their mighty jaws fast locked together. They had fought to the death, and in their closing struggles had got their jaws so tightly locked together that they could not be separated. These whales do not eat each other.

THE GREEDIEST BEAST THAT LIVES IN THE WATERS

The cannibal whale is the grampus, or "killer," as sailors call it. This is a toothed whale of a different type. It has teeth in both jaws, and is the greediest beast in the waters. One grampus has been known to swallow several entire seals one after the other. Although the grampus attains a length of over 20 feet, it would be no match for a sperm-whale in single combat, so several grampuses hunt together, like wolves. By weight of numbers, by their repeated attacks with their powerful jaws, they are able to tire out the biggest whale, and kill and eat it. They have

sometimes powerful allies in the saw-fish and the sword-fish.

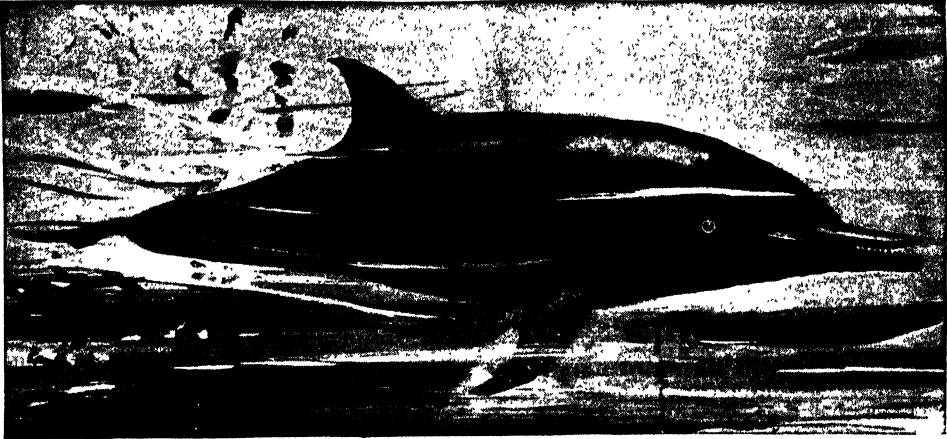
Though the names of these two creatures are similar, the fish themselves are very different. The sword-fish has a great spear growing out from its snout. The saw-fish has, in the same place, a blade of the hardest bone, from both sides of which grow out sharp saw-like teeth. The sword-fish darts with great violence upon its enemy, and stabs with its sword. The saw-fish makes the same sort of rush, but it does not stab and draw out its weapon as the sword-fish does. Instead, when it has thrust its cruel weapon into the soft part of its victim's body, it saws with it, tearing open a great wound, from which even the whale, lord of the waters, must die. Sometimes the sword-fish and the saw-fish join with grampuses in attacks upon the whale. The sword-fish reaches a length of 20 feet; the saw-fish grows to over 12 feet; so the poor whale, with such savage and active foes, has not much chance of life.

THE WONDERFUL STRENGTH A FISH CAN PUT INTO ITS SWORD

The strength of the sword-fish is almost incredible, but here are two instances to show you what it can do. One sword-fish, mistaking a ship for a whale, rushed at it, and drove its weapon right through the sheet of copper by which the hull of the vessel was covered, through a plank of oak 2½ inches thick, through a beam 7½ inches thick, and then through another plank of oak 2 inches thick. Even then it might not have stopped, but at this point the sword broke off.

Another sword-fish, attacking a whaling-vessel, drove its spear through the copper and then through 17½ inches of the hardest oak, and finally through the timber of a barrel of oil. There the weapon remained fixed so tightly that not a drop of oil escaped from the barrel. These are the natural enemies that the poor whale has to face. He himself never attacks other large creatures, and is the most harmless animal in the sea, unless enraged by enemies. In that case he is a terrible foe. With one blow of his awful tail he can shatter the side of a boat. He can send a boat flying out of the water into the air, or, with a single snap of his jaws, can bite a boat to fragments.

THREE STRANGE CREATURES OF THE DEEP



This is the merriest animal in the sea—the dolphin. It eats any kind of fish from salmon to herring, but likes shell-fish as well. Dolphins collect in shoals, and leap and tumble and gambol like happy children.



This does not look much like a mermaid of the fairy stories. It is a dugong, and men mistook it for a mermaid, because when feeding its baby it holds the little one in its arms, and the heads of the two, appearing above the waves, made sailors think that the dugong was a sort of human being.



The American manatee belongs to the same family as the dugong. The two together are called sirenias, from their fancied likeness to mermaids or sirens. The manatee goes up rivers to feed, but the dugong rarely leaves the sea. Both feed on water-plants, and the manatee helps to keep rivers free from weeds.

It is a blessing that the angry whale does not live on the land. We still find traces of his having done so. The paddles with which he swims are his hands. He used to have hands formed like ours, only larger—with four fingers and a thumb. The fingers and thumb are still there, but now they are covered over with skin and flesh to form a paddle. Deep down in his flesh we find also remnants of the bones which, ages ago, formed his hind legs and feet. His ancestor must have lived on land.

THE SEA UNICORN THAT BELONGS TO THE WHALE FAMILY

Porpoises and dolphins do not seem at first sight to resemble whales, but they are members of the toothed whale family. The most curious of the family is the narwhal, also called the sea unicorn, because it has a long horn of ivory growing out from its snout. This is not like the spear of the sword-fish. When a baby the narwhal has two little tusks in the upper jaw. These never grow any bigger in the female, but in the male the left tusk grows to a great size. The right remains small, though it increases in hardness. The left becomes a rod of spiral ivory, from 8 to 10 feet in length. With this weapon the narwhal can do great damage to fish and to boats. But it has no ordinary teeth, so it has to content itself with soft food like the cuttlefish.

A close relation to the narwhal is the white whale, or beluga, from the skin of which much of the so-called "porpoise leather" is made. It is a valuable animal to the Eskimos, who eat its flesh and use its blubber for oil, use its skin for various purposes, and feed their dogs upon what they themselves cannot eat. Thus you will see that many sea animals belong to the dolphin family.

THE BONY ARMOR THE GREAT SEA MONSTERS USED TO WEAR

One of the commonest of sea animals off the Atlantic coast is the porpoise—a handsome, graceful animal, of which the largest are 5 feet in length. It has over a hundred teeth, and its jaws lock together perfectly, so that once it seizes a salmon, a herring, or a mackerel, there is little chance of the victim escaping. The porpoise has a tiny ear, and there remains a spot near it which shows that once it had an outer ear, like the eared

seal. An interesting discovery about the porpoise is that it has on its back fin a number of horny knobs.

These are the last remnants of the bony armor in which sea monsters were clothed after they had ceased to wear a covering of hair. Porpoises are magnificent swimmers, and no fish can escape them. In the tanks of many aquariums near the sea you may sometimes see one alive. They live in fresh sea-water, and are fed on herrings. They swim to and fro in the water as fast as a dog could run, and at the end of the tank they turn as smoothly and quickly as a bird in the air. They remain a long time under water without breathing.

The dolphins are a little longer than the porpoises. They are different, too, about the head. The head of the porpoise is short. The dolphin has a beak like that of a great bird, but in it are more teeth than any other animal has—over 120. Its food is like that of the porpoise, but it likes shell-fish as well as fast-swimming fish.

THE MERRIEST ANIMAL IN THE SEA, WITH OVER A HUNDRED TEETH

The dolphin is the merriest animal in the sea. It assembles in herds of twenty or more, and leaps and tumbles and gambols in the waves as merrily as squirrels in the trees. Dolphins will follow ships for hundreds of miles, and there has never been a ship yet which the swift dolphin could not outpace. The porpoise has a voice, and cries loudly if in distress. So has the dolphin, but it uses its voice for calling to its companions. It is like the distant lowing of a cow.

It is not the lowing of dolphins which makes men believe that they hear and see mermaids at sea, neither is it the sight of dolphins which deceives them. The so-called mermaids are two sea animals called the manatee and the dugong. Together they form one family, which are called sirenias, a name given them from their fancied resemblance, in the face, to mermaids or sirens. To an ordinary person they look like a kind of porpoise. But they do not eat fish. They live on seaweed and water-plants. The Malayan dugong always lives in shallow sea, but the manatees go up the rivers and eat the plants growing in their beds.

Both these animals have round, black heads. When feeding their young they hold them between their arms, or flippers, so that the head of the mother and baby are above the water. Sailors have seen them, and thought that they were mermaids. For thousands of years it has been believed that there are mermaids and mermen, human creatures with tails of fishes. Both these creatures are now rare. The manatee used to be very common in Florida, and all around the Gulf of Mexico; but now a few, carefully protected, in Florida and in Yucatan alone remain; another species abounds in Brazil, however.

THE SEAL FAMILY, AND ITS VARIED USEFULNESS TO MANKIND

The seals are a large group of active, furry, warm-blooded animals, which live in the seas and along its shores. They belong to the great tribe of carnivora, or flesh-eaters; and when you come to examine their teeth and other internal parts, you see that they are near relatives of the bears and dogs which, ages ago, took to a sea-faring life.

There are two divisions among the seals—first, the seals proper, and second, the sea-bears. They differ in many ways, but at present it is enough to say that the hind legs of the true seals are stretched straight behind them, and almost grown together, so that they are useful only in swimming, after the manner of a fish's tail, and there are no outside ears; while in the sea-bears the hinder limbs are separate and movable, enabling these animals to scramble about on land rapidly, and ears are plainly visible. The fur-bears are found chiefly in the North Pacific, though a few live in the southern hemisphere, but the true seals occur in all parts of the ocean. They are most numerous in Arctic and North Atlantic oceans. The best known is the small brown harbor seal, or phoca, which anciently was common all along the coasts of Scandinavia, France, and Great Britain; and similar kinds inhabit the Mediterranean Sea, and even those great interior salt lakes, the Caspian and Baikal, showing that formerly these were connected with the ocean. The harbor seal even now shows itself occasionally on the American coast as far south as New Jersey, but it has been killed off so much

that it is now uncommon south of Newfoundland.

This is only one of several kinds which visit or live in the Arctic regions, and are the principal dependence of the Eskimo people dwelling in Labrador, Greenland, and along the Arctic coasts and islands, for clothing, food, dog-food, light, and winter fuel. In summer the seals swim as far north as the ice will let them, coming into the bays and shallows near shore to catch the fish which are spawning there. This is the hunting-season of the Polar bears and of the Eskimo, the latter shooting, spearing, and trapping the seals in great numbers, using the skins of some kinds for tents and bedding and harness, of others for outer clothing, and of others for inner clothing; and storing the flesh and oil of all, to be eaten next winter or burned in the stone lamps which alone furnish light and warmth in the cabins.

The freezing cold of winter forces most of them a little way south; and in spring, when the ice begins to break and drift out of the bays in great fields or "floes," the seals in thousands float southward with it. On these vast ice-rafts their young are born. Fleets of vessels go from Newfoundland to meet them; and when a floe is encountered, the sailors land and kill the seals, young and old, with guns and clubs, and take away whole shiploads to make their skins into leather, and to extract the oil from the little bodies.

THE HUGE ELEPHANT THAT PARADES THE WATERS

The largest and strongest of the Arctic seals is the hooded, or bladder-nose; and a near relative of it is the Antarctic sea-elephant. This is a giant, and doubly deserves its name. It measures, when fully grown, from twenty to thirty feet in length, and from fifteen to eighteen feet round. Thus it is actually bigger than our land elephant. It has a long snout, like the trunk of an elephant. When on land it can only make its way about slowly and awkwardly, hitching along on its fore-flippers like a man whose legs were strapped tightly together. It has, therefore, been so easily killed that the race is now extinct, save, perhaps, a few about Cape Horn.

THE ANIMAL THAT FIRST WORE OUR SEAL-SKIN COATS AND CAPS

The eared seals consists of the sea-lions, which dwell on the rocky ledges off the western coast of the United States, and are to be seen in every menagerie; and the fur-bears whose skins are taken to make our seal-skin jackets. The skins of other seals are hairy, and good for many purposes; but no species except this one has that fine underfur which is so warm and beautiful, after the furrier has made the skin into soft leather, pulled out the long, coarse, overlying hairs, and dyed its dingy yellow into a shining black.

These seals are seldom found except in the North Pacific. Most of the year they swim in companies in the open ocean, far from land, sleeping on the surface and feeding on fish. In the spring, however, all turn their faces northward, and travel steadily toward Bering Sea. Their purpose is to land on certain islands, far from the continents, and remain there until their young are born—one to each mother. They used to gather at these small, barren islands in millions, crawling out and climbing the hills to the interior in armies, composed of several small females, led by a great male called a "bull," for the crowd seemed like a mighty herd of buffaloes in its way of acting. The animals stayed on the islands two or three months. In August they began to leave, and as winter approached all left for the open sea, taking with them thousands of new babies which had not yet been taught to swim, as even seal-babies must learn to do.

In those early days it seemed as though no matter how many were killed at the islands by the fur-hunters, just as many returned next season as before; but by-and-by a lessening was noticed; and now, after a century of butchery, only a small herd, on a single island, remains where the multitudes used to resort. The American and other governments have tried in many ways to stop the slaughter and preserve the herd. They can guard the seals when they are on the island in the breeding season, but they cannot guard them against men who go after them in swift, sly ships from American, Canadian, Russian, Japanese, and Chinese ports, and kill

them in the open sea. The result has been that seal-skin fur has become scarce and very costly.

The seals are like the camels and the whales—they can close their nostrils tightly, and keep out anything which they wish to exclude. This is necessary for them when in the water. They can remain below the surface without breathing for a long time. Another curious thing about them is that, though they get enormously fat when in the water and feeding regularly, they can go without food for three months at a time.

THE WALRUS, A SEA-GIANT WITH TUSKS OF PURE IVORY

The walrus is included among the seals, though it really is not a seal. Its body is in most respects like the body of an elephant-seal. It grows to a huge size, being from 12 to 15 feet long, and very heavy. It can walk, in an awkward, waddling way on land. Its most remarkable feature is a pair of enormous tusks which grow downward from its upper jaws, like the tusks of the extinct sabre-toothed tiger. These are of the purest ivory, and measure fully 24 inch from the point at which they emerge from the gum. Although he is such a monster, the walrus is one of the least destructive of all the sea animals. Its mighty tusks serve to grub up shell-fish, shrimps, and other little things which live at the bottom of the seas where he makes his home.

THE GREAT LOVE OF THE WALRUS FOR ITS LITTLE ONES

If he can, he will always take to the sea when attacked; but should he have to fight, he can inflict frightful injuries with his tusks.

He is hunted for his blubber and skin as well as for his bristles. The walrus and all the seals have strong bristles about their mouths. These may act as feelers, as the cat's whiskers do; but it is supposed that they serve the same part as the whalebone in dredging and screening the shell-fish which the creatures seek for food. Seals and walruses are devoted to their little ones. The male walruses will give their lives for their babies. Hunters kill the mothers and babies first, because they know that the male walrus will stay and fight to the last.

THE NEXT ANIMAL STORIES ARE ON PAGE 1209.

The Book of STORIES



THE GIANT WITH THREE GOLDEN HAIRS

THERE was once a poor man who had an only son born to him. The child was supposed to be born under a lucky star; and those who told his fortune said that in his fourteenth year he would marry the King's daughter. It so happened that the King of that land, soon after the child's birth, passed through the village in disguise, and asked whether there was any news.

"Yes," said the people; "a child has just been born, who, they say, is to be a lucky one; and when he is fourteen years old he is to marry the King's daughter."

This did not please the King, so he went to the poor child's parents and asked them whether they would sell him their son.

They refused.

But the stranger begged very hard and offered a great deal of money; and as they had scarcely bread to eat, at last they consented, thinking to themselves: He is a lucky child; he can come to no harm.

The King took the child, put it into a box, and rode away; but when he came to a deep stream he threw it into the water.

The box, however, floated down the stream; and some kind fairy watched over it so that no water reached the child, and at last, about two miles from the King's Capital, it stopped beside a mill. The miller soon saw it, and took a long pole and drew it

towards the shore, and inside he found the pretty little boy, who looked up at him with a merry smile. Now, the miller and his wife had no children, and so they were glad to see the baby, and saying, "Heaven has sent it to us," they treated it very kindly, and brought it up with such care that everyone loved it.

About thirteen years had passed over their heads, when the King came by accident to the mill, and asked the miller if that were his son.

"No," said the miller; "I found him when a babe, in a box in the stream, some thirteen years ago."

"He is a fine fellow," said the King. "Can you spare him to carry a letter to the Queen?"

"As your Majesty pleases," answered the miller.

Now, the King had soon guessed that this was the child whom he had tried to drown; and he sent a letter by him to the Queen, saying:

"As soon as the bearer of this arrives, let him be killed and immediately buried, so that all may be over before I return."

The young man set out with this letter, but missed his way, and came in the evening to a little cottage. There was no one within except an old woman, who said:

"Why do you come here? And where are you going?"

"I am going to the Queen, to whom I was to have taken a letter; but I

have lost my way, and shall be glad if you will give me a night's shelter."

"You are very unlucky," she said, "for this is a robber's hut; and if the band returns while you are here it may be worse for you."

But he was so tired that he laid the letter on the table, stretched himself out upon a bench, and fell asleep.

When the robbers came home and saw him, they asked the old woman who the strange lad was.

"I have given him shelter for charity," she said. "He had a letter to carry to the Queen, and lost his way."

The robbers took up the letter, broke it open, and read the directions to murder the bearer which it contained. Then their leader tore it, and wrote a fresh one desiring the Queen, as soon as the young man arrived, to marry him to the King's daughter. Meantime they let him sleep on till morning broke, and then showed him the right way to the Queen's palace, where, as soon as she had read the letter, she had preparations made for the wedding.

After a while the King returned; and when he saw the prediction fulfilled, and that this child of fortune was married to his daughter, he was very angry, and said:

"No man shall have my daughter who does not descend into the wonderful cave and bring me three golden hairs from the head of the Giant King who reigns there."

"I will soon manage that," said the youth. And he took leave of his wife and set out on his journey.

At the first city that he came to, the guard of the gate stopped him and asked what trade he followed, and what he knew.

"I know everything," said he.

"If that be so," replied they, "you are just the man we want. Be so good as to tell us why our fountain in the market-place is dry and will give no water. Find

out the cause of that, and we will give you two asses loaded with gold."

"With all my heart," said he, "when I come back."

Then he journeyed on and came to another city, and there the guard also asked him what trade he followed, and what he understood.

"I know everything," he answered.

"Then pray do us a piece of service," said they. "Tell us why a tree which used to bear us golden apples now does not even produce a leaf."

"Most willingly," answered he, "as I come back."

At last his way led him to the side of a great lake of water, over which he must pass. The ferryman soon began to ask, as the others had done, what was his trade, and what he knew.

"Everything," said he.

"Then," said the other, "pray inform me why I am bound forever to ferry over this water, and have never been able to get my liberty. I will reward you handsomely."

"I will tell you all about it," said the young man, "as I come home."

When he had passed the water, he came to the wonderful cave. But the Giant King was not at home, and his grandmother sat at the door in her easy-chair.

"What do you seek?" she said.

"Three golden hairs from the giant's head," answered he.

"You run a great risk," said she; "yet, when he returns home, I will try what I can do for you."

Then she changed him into an ant, and told him to hide in her cloak.

"Very well," said she. "But I want also to know why the city fountain is dry, and why the tree that bore golden apples is now leafless, and what it is that binds the ferryman to his post."

"Those are three puzzling questions," said the old woman, "but



lie quiet and listen to what the giant says when I pull the golden hair."

Presently night set in, and the Giant King returned home. As soon as he entered he began to snuff up the air, and cried:

"All is not right here: I smell man's flesh." Then he searched all round in vain, and the old dame scolded, and said:

"Why should you turn everything topsy-turvy? I have just set all in order."

Upon this, he laid his head in her lap and soon fell asleep. As soon as he began to snore, she seized one of the golden hairs and pulled it out.

"Mercy!" cried he, starting up. "What are you about?"

"I had a dream that disturbed me," said she, "and in my trouble I seized your hair. I dreamed that the fountain in the market-place of the city had become dry and would give no water: What can be the cause?"

"Ah, if they could find that out, they would be glad," said the giant. "Under a stone in the fountain sits a toad; when they kill him it will flow again."

This said, he fell asleep, and the witch pulled out another hair.

"What would you be at?" cried he, in rage.

"Don't be angry," said she, "I did it in my sleep. I dreamed that in a great kingdom there was a beautiful tree that used to bear golden apples, and now it has not even a leaf upon it: what is the reason of that?"

"Aha!" said the giant, "they would like very well to know that secret. At the root of the tree a mouse is gnawing: if they were to kill him, the tree would bear golden apples again."

Then once more he fell asleep; and when she heard him snore she pulled out the third golden hair, and the giant jumped up and threatened her, but she soothed him, and said:

"It was a strange dream. I thought I saw a ferryman who was fated to row backwards and

forwards over a lake, and could never be set at liberty: what is the charm that binds him?"

"A silly fellow!" said the giant. "If he were to give the rudder into the hand of any passenger, he would find himself at liberty, and the other would be obliged to take his place."

In the morning the giant arose and went out; and the old woman gave the young man the three golden hairs, reminded him of the answers to his questions, and sent him on his way.

He soon came to the ferryman, who knew him again, and asked for the answer which he had promised him.

"Ferry me over first," said he, "and then I will tell you."

When the boat arrived on the other side, he told him to give the rudder to any of his passengers, and then he might run away as soon as he pleased. The next place he came to was the city where the barren tree stood.

"Kill the mouse," said he, "that gnaws at the root, and you will have golden apples again."

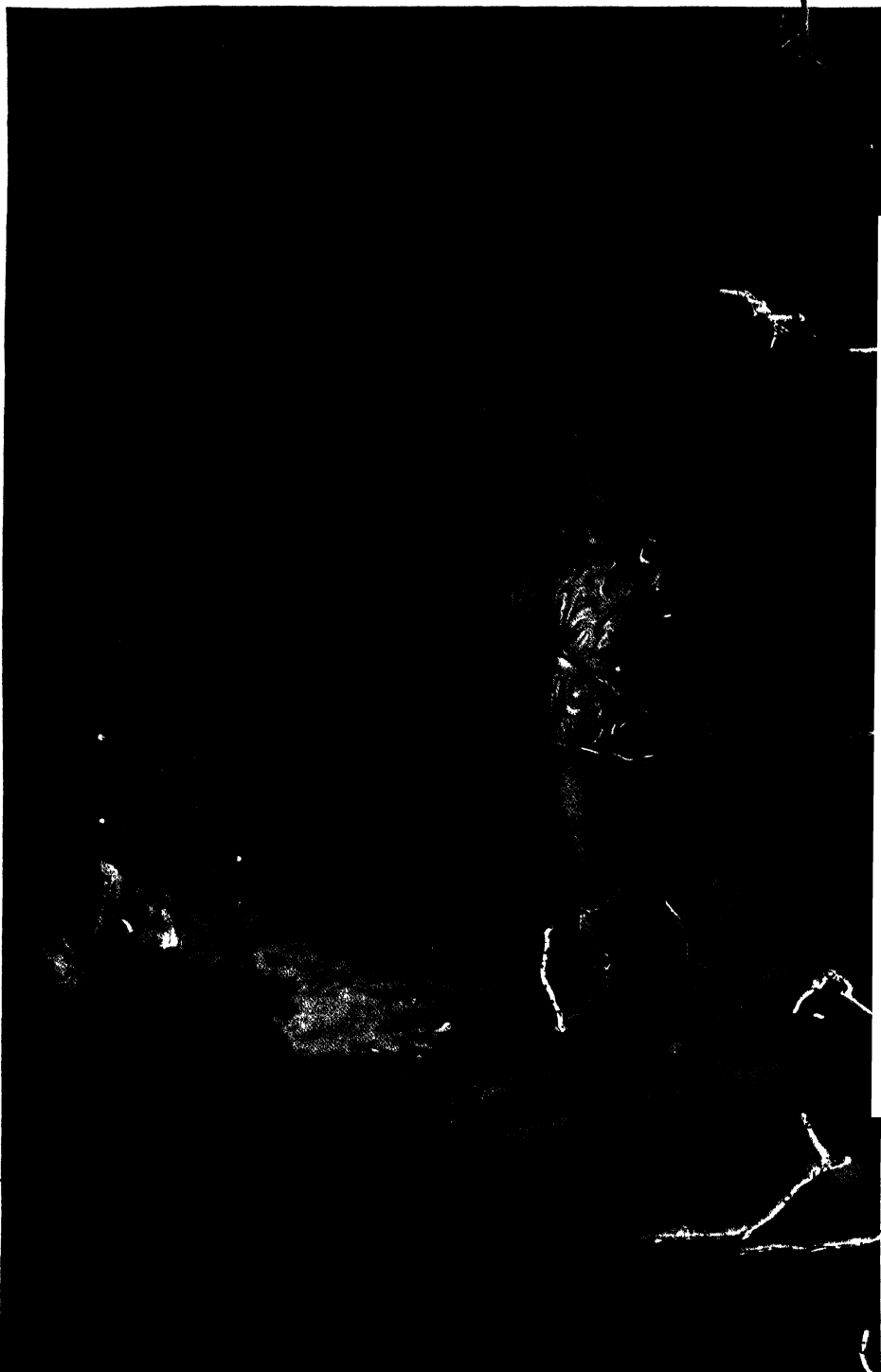
They gave him a rich present, and he journeyed on to the city where the fountain had dried up, and the guard demanded his answer to their question. So he told them how to cure the mischief, and they thanked him and gave him the two asses laden with gold.

And now at last this lucky young man reached home, and his wife rejoiced greatly to see him, and to hear how well everything had gone with him. He gave the three golden hairs to the King, who could no longer raise any objection to him, and he and his beautiful wife lived happily together, and in due time became King and Queen.

The old King was well punished, for he was the very next person the ferryman saw. The ferryman gave the rudder into his hand, and to this day the old King sits, ferrying passengers across the lake.



THE WITCH AND THE MILLER'S SON



After many adventures the miller's son arrived at the famous cave. While the giant slept the old witch plucked the three golden hairs from his head. In the morning the giant arose and went out. Then the witch gave the young man the precious hairs which were to win for him the hand of the beautiful princess.



WHY IS THE SEA NEVER STILL?

THERE are times when the sea is nearly still, though no doubt even when it looks like glass there are waves in it too small for us to see. But the sea is almost always moving, though perhaps we can scarcely see it move, simply because the air above it is moving.

It is the wind that makes the waves. If there were no wind at all, the sea would slowly swell up and fall again, owing to the tides made by the moon; but it would do this very quietly, so that if you just looked for a moment you would notice nothing. But the waves, which you are thinking of when you ask this question, are made by the wind. It is true that the sea may have great waves though there is no wind, but those waves were raised by the wind somewhere else, and they have traveled to reach our eyes.

Only a short distance below the surface the sea is quite quiet; there is no such thing as waves "mountains high," and if you could see the water not so many feet down, during the greatest storm that ever was, you would find it quite still. That, of course, is simply because the waves are made by the movement of the air, and the effect of that cannot reach very far down.

WHAT MAKES THE WATER RIPPLE WHEN WE THROW A STONE INTO IT?

This is an easy question to answer
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CONTINUED FROM P. 921



if we remember one or two great facts that are true everywhere and always. In the

answer to the last question we said that there may be great waves in the sea, though there is no wind, because those waves have traveled from where they

were made. That is exactly what happens when you throw a stone into a stream or a pond. The wave motion, as we call it, starts where the stone falls.

Now, it is one of the great laws of Nature that when anything is at rest it stays at rest until something moves it; and when anything is started moving it will go on moving until something stops it.

If nothing stopped it, it would go on moving for ever and ever. This applies to the stone that you throw, and it applies to the wave the stone makes when it strikes the water. When a stone strikes water, or when a sound is made in the air at any point, or when a light is made, a wave motion in each case is started, which travels out from the point where it started in all directions, and will go on traveling for ever unless something stops it.

Of course, one of the things which stops it in the case of a water wave is friction, which simply means rubbing, as the parts of the water push against each other. Then it is quite natural that, as the wave gets bigger and wider, it spreads out its power over more space, and so the waves

are not so big when they reach the bank as they were when they were started.

WHY DOES A WAVE BREAK ON EACH SIDE OF A CHANNEL AT THE SAME TIME?

When a wave is started anywhere in anything, in water, or air, or anything else, not only does it travel outwards from that point in all directions equally if it can, but it travels at the same rate in all directions. If three of you are out in the open air, standing at the corners of a triangle, and one speaks, the other two will hear what he says at the same time—that is to say, the wave which he has made breaks against the ears of the two listeners at the same time, because it has taken the same time to reach them. That is very much the same as the case of the wave in a channel, and the width of the channel does not matter any more than the distance you are standing apart matters in the case I have described. The same rule holds all the time.

WHAT MAKES A CURRENT IN THE SEA?

I suppose you know quite well what a current is; it is not the same thing as a *wave*, which, though it seems to move onwards, is really due to the water moving up and down. After the wave has passed, the water is in the same place as it was before. But in the case of a current—which really means something that is running—the water is actually moving from one place to another. There is a lake in Switzerland through which a river runs, and by the difference in the color of the water you can see where the river is. That is a real current. In that case it is easy to understand what makes it. The water of the river is falling to the sea, which is lower down than the place where the river started, and it is really the earth's attraction which is pulling the water of the river through the lake, so making the current.

Now, in the sea, also, currents are due to something which is pulling or pushing part of the water of the sea through the rest of the water. I am sure you see that this is quite a different thing from a wave traveling over the sea, in which case the wave travels, but the water really does not. These currents may be due to many causes; sometimes it may be a steady wind blowing for some time in one particular

direction, and not only making waves, but also driving some of the water of the sea really before it. More often, perhaps, currents are due to differences in the heat of the water. Warmer water in colder water will keep to itself, so to speak, and will move through the sea. If the sun shines brightly on a particular part of the sea, then it makes the water there hotter, and so may start a current. Indeed, the currents of water in the sea are often due to very much the same causes as the currents in the air, which we call wind.

WHY DO WE COOK OUR FOOD?

There are many good reasons why we should cook certain kinds of food. Perhaps the best is that cooking makes it softer and loosens it, so as to help our teeth. This is especially true in the case of meat. Another good reason for cooking food is that the cooking kills any microbes which may be in it, and some of which might do us a great deal of harm. It is certainly much better to boil, or cook, our milk, unless we are very sure where it comes from, and a great deal of the food that we eat now, especially in cities, would certainly hurt us, by means of the microbes in it, if it were not cooked. A third reason why we cook our food is in order to make it look nice. This is especially true of meat. We have grown to dislike the look of red meat, and we prefer it cooked, so that the red colour of the blood in it is changed. There is a very great deal to say about this interesting question, but there is no room for that now, and meanwhile you must think over the three answers I have given you.

WHERE DOES THE WIND GO TO WHEN IT DOES NOT BLOW?

This question makes us begin at the very beginning in talking about the wind. The wind is a movement in the air—a current like a current in the sea, or a current you may make in your tea when you stir it, or in a basin of water if you move your finger through it. Well, if there is nothing to make a current in your tea, the tea lies still; and if there is nothing to make a current in the air—that is to say, a wind—then the air lies still, and there is no wind. So, really, the only answer to the question is that the wind goes nowhere when it does not blow; and what I mean by this is that the wind

is not a *thing* like an orange, but it is a particular *state* of the air, a state of movement, and so when the wind does not blow it is not because the wind has hidden itself away somewhere, but simply that the air is still, and that is another way of saying there is no wind.

WHERE DOES THE WIND BEGIN?

If the wind is a movement of part of the air through the air around it—and every wind is that—then we must find something which moves it; for we know that, in the case of the air, as in every other case, things which are at rest remain at rest until something moves them. The general rule about the wind is simply that it is the air moving from a place where the air is more dense or tightly packed to a place where it is rarer or less tightly packed.

People who study the weather nowadays understand how there are changes always going on in the pressure of the air at one place as compared with another; and all these changes must produce wind, since air is always moved from a place where its pressure is high to a place where the pressure is lower—somewhat in the same way as water will always try to form a level surface instead of being heaped up higher in one place than in another. If, then, we have any instrument—and the barometer is such an instrument—which tells us how the pressure of the air around us is changing, and whether it is low or high, we shall be able to guess fairly well what sort of weather we shall have, because we shall be able to guess how the wind will blow. In a slight breeze the moving air, which makes a wind, moves at such a rate as four or five miles an hour; say, a little faster than a good walker. In a gale the air will move as fast as an express train.

WHAT MAKES THE WIND WHISTLE?

The howling and whistling and all the other noises made by the wind are not heard as a rule when we are out of doors, but only when we are in a house. As the moving air forces itself through chinks of doors and windows, or perhaps even down the chimney, and so on, it sets all sorts of things that it meets vibrating or trembling, and so produces all kinds of sounds, and these are often almost musical. Often people are very

much frightened by these noises, yet if they went out of doors into the wind itself they would not hear them. The wind passing through the air—that is to say, the current of air passing through the air—does not make itself known to us in sound because what our ears can hear is not a current, but a wave in the air. You cannot hear a draught.

WHAT MAKES AN ECHO?

An echo is really a very simple thing, said the Wise Man, and directly you know what sound is you can almost answer this question for yourself.

Sound is a wave in the air, and anything which will stop that wave and send it back again without altering its shape will make an echo. It is really much the same as the waves of the sea striking against a breakwater and coming back again. If the waves get broken up so that, instead of coming back as they went, they come back irregularly, then you will not hear a distinct echo, just as you will not see your face plainly in a mirror unless it is smooth. So the places where you get the best echoes are places where the sound waves are thrown back exactly as they came, just as the light waves are thrown back from a mirror. To make an echo, however, we must be standing far enough away from the wall, or whatever it is that throws the waves back, to give the ear time to hear the sound itself, and then to hear the waves as they come back.

WHAT MAKES THE ECHO WHEN WE SHOUT OUT OF DOORS?

In some large buildings an echo may be a great nuisance, for it may interfere with our hearing of a speaker or of music. In these cases it is the walls of the building which throw back the waves of sound; but very often, as this question suggests, we may hear a quite clear echo when it is not easy to say what it is that is throwing the waves back. Sometimes, also, the waves may not come back exactly as they went, but still come distinctly enough to be heard, and then people may fancy that someone else is speaking to them. I believe that many mistakes and wild notions that people have had have been due to thinking that there was some mysterious person making sounds, when really it was nothing but an echo.

Sound is a very curious thing, and we do not quite understand it yet; but we know that there are many ways in which it may be thrown back or reflected, even though there is no high wall to do so. For instance, a clump of trees will often make an echo, and it may possibly be that sound is thrown back from the air itself, perhaps because the air is really made up of different levels of air, some of which are lighter than others; and when the sound waves pass into them part of them is thrown back. We know that this happens to light also, and, indeed, it is a general rule that when a wave of any kind passes into something different from what it has just been traveling in—out of air into water, and so on—part of it is likely to be thrown back.

WHY CAN WE NOT SEE THE BOTTOM OF A RIVER?

When we were talking about echoes, we said that when a wave passes from one kind of stuff it is moving through into another, part of it is usually turned back or reflected. Now, light is a kind of wave, and it follows this rule. In passing through a window some of it is bent back, so that you can sometimes see your own face in a window; as, for instance, in the window of a railway car in a tunnel. Exactly the same thing happens when light passes from air into water; part of it is bent back, and it often happens that so much will be bent back that you will simply see the light from your own face, just as if you were looking into a mirror. But exactly what happens depends on a great many things; and if you try in these cases, and if the light is coming in the right direction, you will often be able to see not the light thrown back from the surface of the water, but the light thrown back from the bottom of the river.

COULD WE SEE TO READ BY THE LIGHT OF THE FIRE INSIDE THE EARTH?

This is rather a funny question, said the Wise Man, and I am sure you will see that it is not very easy to answer, if you remember that the deepest hole that has yet been made in the earth is only about a mile and a quarter deep; so that we are talking about what no one has ever seen. But I

can answer your question this way: If we could peel off the crust of the earth, as we peel an orange, so that the glowing centre or glowing core of the earth were exposed, certainly it would be very bright indeed, something like a very tiny model of the sun; and certainly we could see to read by it. Only, of course, I do not quite know where we should be if this happened! But it is useful, and helps our minds to think that, though we live on a crust that is quite cool, yet underneath it there is a glowing core which, if it could be seen, would certainly give out a brilliant light—bright enough, I dare say, for people on the moon to read by, if there were any people there.

WHY IS INDIA HOTTER THAN ALASKA?

If you have read the answer to the last question you will see that we live "between two fires," as the saying goes. Underneath us is the fire of the earth; above us, as we say, is the great fire of the sun. Now, the differences between different parts of the surface of the earth, which make India, for instance, hotter than Alaska, have nothing to do with the fire that is underneath us. The whole difference is due to the way in which the heat of the sun strikes the earth in Alaska as compared with India.

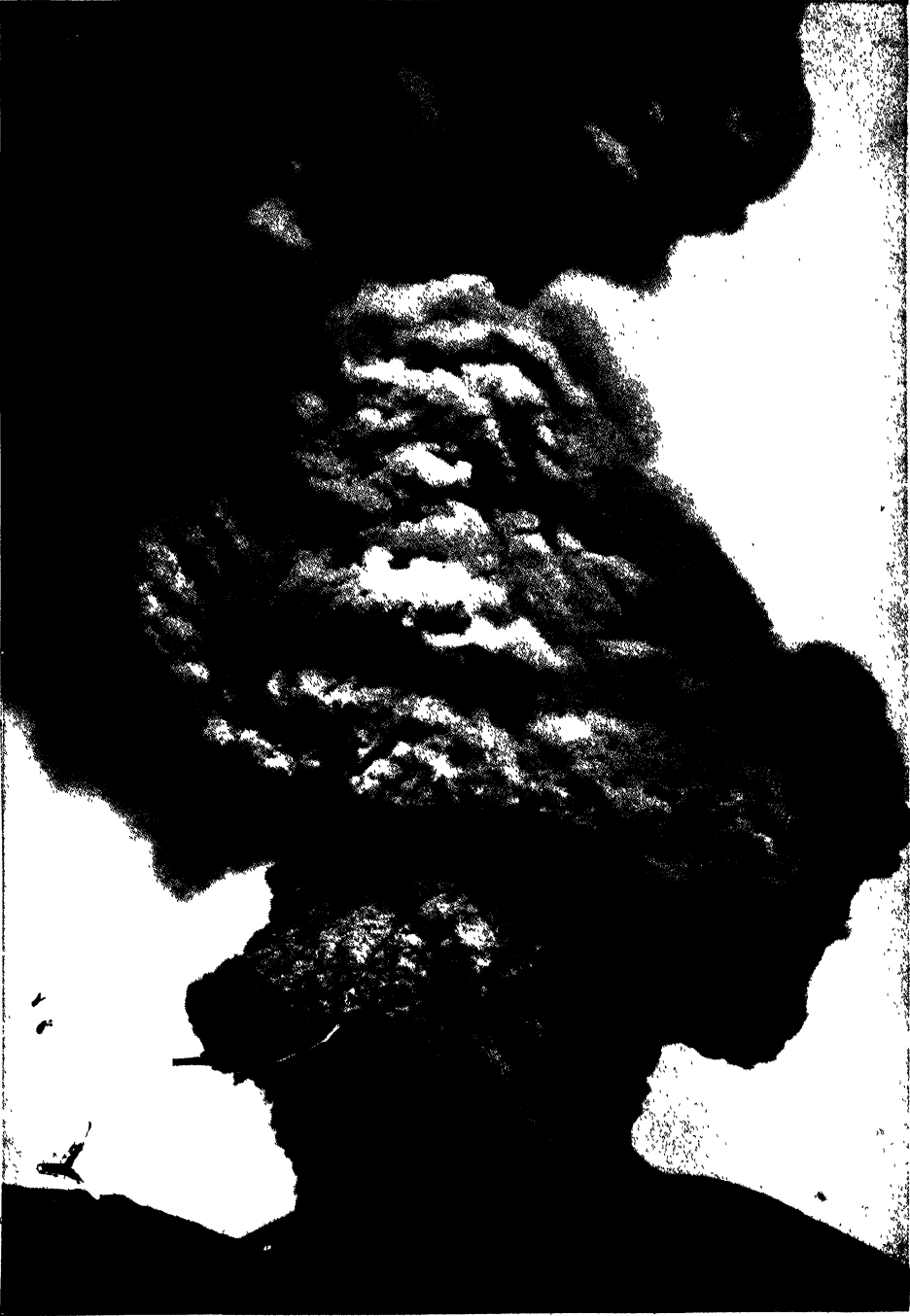
The sun's light and heat have to pass through the air before they reach us, and the air takes up a great deal of both light and heat as they pass through it. In parts of the earth, then, where the sun's rays pass straight through the air, it is very hot and the sun is very bright.

In such parts of the world the sun seems to rise right up into the top of the sky, and the people are protected only by just the bare thickness of the air. But in other parts of the world the sun's rays have to pass through the air in a slanting direction so that they really have a very much longer journey through the air than if they came straight down through it; and so the sun seems much less bright, and its heat is far less intense.

WHY IS FIRE HOT?

When anything is burning to make a fire, there is given out from it a par-

THE FIRE BURNING INSIDE THE EARTH



The earth is a great ball, the inside of which is solid and very hot. Between the hot inside and the cold crust is a layer that is on the point of melting; and if at any time the crust should break and open a passage to the surface of the earth, then this layer will melt and the molten rock will come out and form a hill called a volcano. The hot molten rock is called lava, and at times it flows over fields, burns forests, and destroys villages or towns if they happen to be in its path. But if water finds its way into the passage of the volcano, then explosions take place and hot gases, smoke, ashes, and rocks are thrown up into the air as shown in the fine photo of Vesuvius on this page. At times volcanoes burst with great violence, and Vesuvius, the great volcano of Italy, has destroyed whole cities, one of them, Pompeii, which was overwhelmed soon after the birth of Jesus Christ, having been dug out of the earth, so that to-day we see it as on page 6211.

ticular something which we call heat. This heat, is very like light, though we cannot see it. Like light, it is a wave motion in the ether, and in itself is not hot nor cold, but is nothing more or less than what I have said—a wave motion in the ether, made up of waves or rays. As it is made of rays it is often called radiant heat. This radiant heat comes to us, of course, in great quantities from the sun.

So, when you ask me why is fire hot, there are really two parts to that question. I have tried to answer the first part, but the second part is this: Why does radiant heat make us feel hot? The only answer to that is that our sense of heat is a feeling, just like seeing and hearing. So heat makes us feel hot just as light makes us see, and sound makes us hear. To put it in another way; our bodies are so made that they feel these various things outside them in these various ways.

WHY IS A SPARK MADE WHEN STEEL IS KNOCKED BY A HARD STONE?

Remember that nothing in the world is ever *lost*, but only *changed*. When you strike steel with a hard stone, the movement of the stone is not lost, it is not made into nothing; but, just in so far as it disappears, it is changed into something else.

No power goes out of the world—though it may be wasted. So we may say that the movement of a stone—which comes from the movement of your arm, which comes from the power in your food, which was made by the light of the sun—is changed into heat and light, and this shows itself in a little bit of the stone which is chipped off, and which shows its light for a moment as it jumps and falls; and that is what we call a spark. You know, of course, that long ago, before matches were invented, it was in some such kind of way as this that men had to make fire, as the pictures appearing on page 810 of this book show us.

Of course they had to have something ready which very easily took light when sparks fell upon it. You can even get a spark by rubbing two dry sticks together; but when I say *you* can, I do not advise you to try in a damp country, for you would be disappointed.

You must go somewhere where there is no water at all in the air. What we would call a dry stick in this country would be a wet one in England, for the air in that country is very watery, and water takes heat away so quickly into itself that it always interferes with fire.

WHAT MAKES HEAT TRAVEL ALONG AN IRON BAR?

There are many ways, said the Wise Man, in which heat travels from one place to another. One way is by rays, and is called *radiation*. You remember that, because we were talking about radiant heat a little while ago. Then, again, heat can move about simply because a hot thing moves about and takes its heat with it. That happens in a kettle when it is boiled. The hot water at the bottom runs up to the top, and takes its heat with it. This is a case of carrying the heat, is it not? And so, when heat moves in this way, the proper name for it is *convection*. If you think that a very difficult word, all I can say is that it is just the same as the word "conveying," and if you know what to "convey" means, you know exactly this way in which heat travels.

Now, you will say this is all very well, but when heat runs along an iron bar it is not a case of radiation, nor is it a case of conveying or convection, for certainly parts of the bar do not run through it carrying the heat with them. And you are quite right. If you read the next answer, you will find what you want.

WHY DOES NOT HEAT RUN ALONG A STICK?

A poker is an iron bar, and we know that heat runs along it; yet a stick of firewood, though it is very short, may be burning at one end, and you can hold the other end in your hand without finding it hot at all. The heat does not run along the stick.

Now, in the case of the poker, the heat travels along through the little parts that make the poker, not because they move, but because each of them hands it on to the next. The proper word for this is *conduction*, and you see that it is quite different from convection or conveying. It is as if the atoms of the poker were a sort of stepping-stones, and the heat walked from one to the other.

Now, the poker is so made that the atoms of it are good stepping-stones for heat; indeed, iron, like all metals, lets heat run through it very quickly.

The proper way of saying this is that all metals are good conductors of heat. But the wood is made differently. It is as if the stepping-stones were too far apart, so that the heat cannot pass across them. So we say that wood is a bad conductor of heat. Everything that is good to use in making clothes is a bad conductor of heat, but I think you knew that already.

WHY DOES COLD WATER CRACK A HOT GLASS?

The reason why cold water cracks a hot glass is exactly the reason why hot water cracks a cold glass. But this does not always happen. If you use a very thin glass it will not crack either by cold water or hot water. The chemist very often uses little tubes made of very thin glass, which he calls test-tubes; and you can put these in a flame and boil water in them, without their cracking.

You might think that the thinner the glass the more readily it would crack, but really it is just the other way about. When you fill an ordinary tumbler with hot water, the heat is conducted from the water to the glass, and the glass expands or swells, but the heat has not yet reached the outside part of the glass, which stays as it was. And so, as the inner layer of the glass, which has been made hot, swells, it cracks the cold outside. Just the opposite happens when a hot glass is filled with cold water; the inside shrinks before the outside does, and so breaks it. But if you use very thin glass the heat gets through it so quickly, whether going into it or coming out of it, that it all swells or shrinks together and does not crack.

CAN WE FALL OFF THE EARTH?

We cannot fall off the earth because the earth holds us to itself by means of its attraction. The earth is so big that its power of attraction is great, and if we wished to escape it altogether we should have to use some other power sufficiently great to succeed in opposing the pull of the earth. Thus, though we cannot fall off the earth, we can imagine that we might be shot off the earth if there were some gun strong enough,

but it would have to be thousands of times stronger than the biggest gun ever made. If there were no air it would be easier to shoot something up into the sky so hard that the earth would not be able to pull it back again. But, as it is, the air keeps everything back that is thrown or shot up into it. You could not throw a tennis-ball very far in water; and that suggests the kind of way in which the air would push a cannon-ball back if we tried to shoot it away from the earth altogether. Have you read the famous book of Jules Verne, which tells how some men were shot in a cannon-ball from the earth to the moon?

WHERE SHOULD WE GO TO IF WE FELT OFF THE EARTH?

The best way to imagine how we could fall off the earth would be to suppose that somehow or other the earth's power of attraction stopped altogether. If that happened, and you jumped indoors, your head would hit the ceiling. If out of doors you would go straight up into the sky for a long way, but the resistance of the air would make you move slower and slower until at last you came to a stop. There you would stay, and very cold you would find it. But suppose that not only the earth stopped pulling, but also that the air stopped resisting you. Then, if you jumped—the least little jump would do—you would sail away off into space.

That is the only way in which you could "fall off the earth." If you jumped at the right moment, as the cannon was shot at the right moment in Jules Verne's story, then you might travel towards the moon until you came near enough to feel the pull of the moon, on to which you would fall. You would certainly fall so hard that that would be an end of you, especially as the moon has no air to break your fall.

But if this did not happen you would be pulled into the sun. If the earth stopped moving round the sun at this moment, it would fall into the sun. Other things might happen to you, too. If the earth's attraction still remained, you might move round and round it and become a sort of second moon! The moon, we know, really fell off the earth to begin with.

THE NEXT QUESTIONS BEGIN ON PAGE 1159.

